United States Department of Agriculture

Natural Resources Conservation Service

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

Soil Survey of Clark County, Ohio

Part II

How to Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the general soil map units, detailed soil map units, and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

On the **general soil map**, the survey area is divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

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

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

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

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

The **Contents** in Part II shows which table has data on a specific land use for each detailed soil map unit. See the **Contents** in Part I and Part II for other sections of this publication that may address your specific needs.

A *State Soil Geographic Data Base (STATSGO)* is available for the county. This data base consists of a soil map at a scale of 1:250,000 and descriptions of groups of associated soils. It replaces the general soil map published in older soil surveys. The map and the data base can be used for multicounty planning, and map output can be tailored for a specific use. More information about the State Soil Geographic Data Base for this county, or for any part of Ohio, is available at the local office of the Natural Resources Conservation Service.

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

Major fieldwork for this soil survey was completed in 1991. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1991. This survey was made cooperatively by the Natural Resources Conservation Service, the Ohio Department of Natural Resources, Division of Soil and Water Conservation, the Ohio Agricultural Research and Development Center, and the Ohio State University Extension. It is part of the technical assistance furnished to the Clark Soil and Water Conservation District. The survey was materially aided by funds provided by the Clark 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.

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Cover: A farmstead in an area of Miamian silt loam, 2 to 6 percent slopes.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

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Detailed Soil Map Unit Legend

Ad—Adrian muck, drained
Ae—Adrian muck, undrained
Ca—Carlisle muck, drained
Cb—Carlisle muck, undrained
CcD2—Casco gravelly loam, 12 to 20 percent slopes, eroded
CeA—Celina silt loam, 0 to 2 percent slopes
CeB—Celina silt loam, 2 to 6 percent slopes
ChA—Celina-Strawn complex, 0 to 2 percent slopes
ChB—Celina-Strawn complex, 2 to 6 percent slopes
CrA—Crosby silt loam, 0 to 2 percent slopes
CrB—Crosby silt loam, 2 to 6 percent slopes
DoE—Donnelsville channery silt loam, 18 to 30 percent slopes
DpF—Donnelsville-Rock outcrop complex, 30 to 70 percent slopes
Dr—Drummer silty clay loam, gravelly substratum
EmA—Eldean silt loam, 0 to 2 percent slopes
EmB—Eldean silt loam, 2 to 6 percent slopes
EmB2—Eldean silt loam, 2 to 6 percent slopes,eroded
EmC2—Eldean silt loam, 6 to 12 percent slopes, eroded
EnC2—Eldean-Casco complex, 6 to 12 percent slopes, eroded
EpB2—Eldean-Miamian complex, 2 to 6 percent slopes, eroded
EpC2—Eldean-Miamian complex, 6 to 12 percent slopes, eroded
EpC3—Eldean-Miamian complex, 6 to 12 percent slopes, severely eroded
EpD2—Eldean-Miamian complex, 12 to 18 percent slopes, eroded
EpD3—Eldean-Miamian complex, 12 to 18 percent slopes, severely eroded
EpE2—Eldean-Miamian complex, 18 to 30 percent slopes, eroded
EsE3—Eldean-Rodman complex, 18 to 30 percent slopes, severely eroded
EuB—Eldean-Urban land complex, 2 to 6 percent slopes
EuC—Eldean-Urban land complex, 6 to 12 percent slopes
Ge—Genesee silt loam, till substratum, rarely flooded
Gn—Genesee silt loam, till substratum, occasionally flooded
Ko—Kokomo silty clay loam
Lg—Linwood muck, undrained
Lh—Linwood mucky silt loam, drained
Lm—Lippincott mucky silt loam
Lp—Lippincott silty clay loam
Lu—Lippincott-Urban land complex
MgB2—Miamian silty clay loam, limestone substratum, 2 to 6 percent slopes, eroded
MgC2—Miamian silty clay loam, limestone substratum, 6 to 12 percent slopes, eroded
MgE2—Miamian silty clay loam, limestone substratum, 18 to 30 percent slopes, eroded
MhA—Miamian silt loam, 0 to 2 percent slopes
MhB—Miamian silt loam, 2 to 6 percent slopes
MhB2—Miamian silt loam, 2 to 6 percent slopes, eroded
MhC—Miamian silt loam, 6 to 12 percent slopes
MhC2—Miamian silt loam, 6 to 12 percent slopes, eroded
MhD2—Miamian silt loam, 12 to 18 percent slopes, eroded
MhE—Miamian silt loam, 18 to 30 percent slopes
MhE2—Miamian silt loam, 18 to 30 percent slopes, eroded
MkB2—Miamian silty clay loam, 2 to 6 percent slopes, eroded
MkC2—Miamian silty clay loam, 6 to 12 percent slopes, eroded
MkD2—Miamian silty clay loam, 12 to 18 percent slopes, eroded
MmC3—Miamian clay loam, 6 to 12 percent slopes, severely eroded
MmD3—Miamian clay loam, 12 to 18 percent slopes, severely eroded
MmE3—Miamian clay loam, 18 to 30 percent slopes, severely eroded
MnB—Miamian-Urban land complex, 2 to 6 percent slopes
MnC—Miamian-Urban land complex, 6 to 12 percent slopes
Mo—Milford silty clay loam, sandy substratum
Ms—Millsdale silty clay loam
MtA—Milton silt loam, 0 to 2 percent slopes
MtB—Milton silt loam, 2 to 6 percent slopes

MvC2—Milton silty clay loam, 6 to 12 percent slopes, eroded
MxB—Milton-Urban land complex, 2 to 6 percent slopes
OcA—Ockley silt loam, 0 to 2 percent slopes
OcB—Ockley silt loam, 2 to 6 percent slopes
Pa—Patton silty clay loam
Pg—Pits, gravel
Ph—Pits, quarry
RaA—Randolph silt loam, 0 to 2 percent slopes
RgE—Rodman gravelly loam, 18 to 35 percent slopes
Rn—Ross silt loam, occasionally flooded
Ro—Ross silty clay loam, rarely flooded
RuA—Rush silt loam, 0 to 2 percent slopes
ScA—Savona silt loam, 0 to 2 percent slopes
So—Sloan silt loam, sandy substratum, occasionally flooded
StB2—Strawn silty clay loam, 2 to 6 percent slopes, eroded
StC2—Strawn silty clay loam, 6 to 12 percent slopes, eroded
StD2—Strawn silty clay loam, 12 to 18 percent slopes, eroded
StE2—Strawn silty clay loam, 18 to 35 percent slopes, eroded
SuA—Strawn-Crosby complex, 0 to 2 percent slopes
SuB—Strawn-Crosby complex, 2 to 6 percent slopes
ThA—Thackery silt loam, 0 to 2 percent slopes
Tr—Tremont silty clay loam, rarely flooded
Ts—Tremont silt loam, occasionally flooded
Ud—Udorthents, loamy
Ur—Urban land
Wc—Wallkill silt loam, occasionally flooded
WeA—Warsaw silt loam, 0 to 3 percent slopes
WpA—Waupecan silt loam, 0 to 2 percent slopes
WrA—Waynetown silt loam, 0 to 2 percent slopes
Wt—Westland silty clay loam

Foreword

This soil survey contains information that can be used in land-planning programs in Clark 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 Natural Resources Conservation Service or the Ohio State University Extension.

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Soil Survey of Clark County, Ohio

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

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

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

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

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

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

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

Table 1 shows the classification of the soils in this survey area. Table 2 shows the extent of the soils in the survey area.

Agronomy

More than 180,000 acres, or about 72 percent of the cropland in the county, was used as cropland and pastureland in 1982, according to the Clark Soil and Water Conservation District Resources Inventory. Of this total, nearly 17,400 acres, or about 6.9 percent, was used as pastureland.

The soils in Clark County vary widely in their suitability for specific crops, and they require widely different management. Certain basic management practices, however, such as maintaining an adequate level of soil fertility, improving existing drainage, controlling erosion, and maintaining or improving soil tilth, are needed on nearly all of the soils in the county. Many of the soils in the county are suited to the crops commonly grown in the area and to some crops that are not commonly grown, such as barley, grain sorghum, popcorn, and sunflowers.

Deep and very deep soils that are characterized by good natural drainage and that warm early in the spring are especially well suited to many vegetables, small fruits, nursery plants, and orchards. These soils include the Eldean, Ockley, Rush, Warsaw, and Waupecan soils that have slopes of less than 6 percent and that are on terraces and outwash plains. These soils may also occur in low areas where air drainage is poor and frost is earlier and more frequent. These areas generally are poorly suited to some early vegetables, small fruits, and orchard crops.

The latest information and suggestions for growing specialty crops can be obtained from local offices of the Cooperative Extension Service and the Natural Resources Conservation Service.

The potential for increased crop production in Clark County is good. The acreage farmed and the yields per acre could both be increased. Food production can also be increased by applying the latest crop production technology to the existing cropland in the county. This soil survey can greatly facilitate the application of such technology. In addition to the land currently being cropped, some land that is idle land, woodland, or unimproved pasture could be used as productive cropland, but the cost of converting this land to cropland and the impact of these conversions on the environment should be considered. Also, the 1985 Food Security Act places certain restrictions on bringing wetlands and highly erodible fields into production for those who participate in Federal farm programs.

Some of the cropland and pastureland in Clark County has been used for urban development. About 11 percent of the county is urban land (USDA, 1971). The acreage used for crops and pasture has been affected by the use of land for urban development or other uses.

Soil drainage is a major management concern on more than 104,000 acres of land in Clark County. This acreage does not include miscellaneous areas or urban land. Also, erosion is a hazard where slopes are more than 2 percent. Celina and Crosby soils that have slopes of more than 2 percent are subject to wetness and to erosion.

Soil erosion is damaging for two reasons. First, the productivity of the soil is reduced. Second, the water in streams and lakes can become polluted. Erosion of the surface layer is especially damaging on soils that have a clayey subsoil. Celina, Crosby, Eldean, Miamian, and Milton soils are examples. As the surface layer is removed, part of the clayey subsoil is incorporated into the plow layer. The higher clay content in the surface layer reduces soil tilth, resulting in a poorer seedbed. More energy is then required to till the soils, and more fertilizer is needed to replace lost plant nutrients. Soil erosion is also damaging to soils that are moderately deep, such as Milton soils, because it further reduces the root zone. Erosion reduces productivity on soils that tend to be droughty, such as Eldean, Milton, and Rodman soils. The surface layer stores the largest amount of water. Erosion reduces the available water capacity in the surface layer.

Erosion degrades water quality by increasing the amount of sediment in streams. By volume, sediment is the largest pollutant of streams in Clark County. Sediment indirectly degrades water quality because of the organic matter, plant nutrients, herbicides, and insecticides it carries from eroding fields. Controlling erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal and recreational uses and for fish and other wildlife.

Practices that control erosion provide a protective cover of vegetation, reduce the runoff rate, and increase the rate of water infiltration. A cropping system that keeps plant cover on the soil for extended periods reduces the hazard of erosion. Including forage crops of legumes and grasses in the rotation reduces the hazard of erosion, provides nitrogen, and improves tilth. Because the gently sloping Eldean, Miamian, and Strawn soils have short, irregular slopes, erosion is a severe hazard if these soils are farmed using conventional methods. A system of conservation tillage leaves crop residue on the surface, increases the rate of water infiltration, and helps to control runoff and erosion. Contour farming and terraces generally are not practical on these soils because of the short, irregular slopes. Celina, Eldean, Miamian, Milton, Ockley, Rush, Thackery, Warsaw, and Waupecan soils and some alluvial soils are well suited to no-till planting. Eroded phases of Casco, Eldean, Miamian, and Strawn soils are suited to no-till. Crosby, Randolph, Savona, and Waynetown soils are suited to no-till planting if they are adequately drained.

Grassed waterways are natural or constructed outlets protected by grass cover (fig. 1). Natural drainageways are the best locations for waterways because they typically require a minimum of shaping. Effective waterways are constructed with sufficient capacity to handle surface flow but should still be crossable with farm machinery.

Soil blowing is a hazard on soils that have a mucky surface layer, for example, Adrian, Carlisle, and Linwood soils. These soils are subject to damage if winds are strong and the soils are level and dry and bare of vegetation or mulch. Maintaining a surface cover of mulch or keeping the surface ridged or rough through proper tillage minimizes soil loss by wind. Field windbreaks of suitable shrubs or trees are also effective in reducing the hazard of soil blowing.

Information on the design of erosion-control practices for each kind of soil is available at the local office of the Clark Soil and Water Conservation District.

Soil wetness is a major management concern in Clark County. Subsurface and surface drains are used to remove excess water and thus allow tilling and planting early in the spring. Short-season or early maturing crop varieties can be harvested earlier. Subsurface drains lower the seasonal high water table and thus increase the depth to which plant roots can penetrate. Some of the soils commonly have a seasonal high water table near or above the surface. Natural drainage outlets are generally not available because of the position of the soils on the landscape. If a drainage system has not been provided, these soils are usually too wet for the production of most of the commonly grown crops. The very poorly drained Adrian, Carlisle, Drummer, Kokomo, Linwood, Lippincott, Milford, Millsdale, Patton, Sloan, Wallkill, and Westland soils have a seasonal high water table near or above the surface during part of the year.

Somewhat poorly drained soils, such as Crosby, Randolph, Savona, and Waynetown soils, have a water table in the upper part of the subsoil in winter and spring. Subsurface drainage is needed for most crops. Even if they are drained, these soils generally stay wet longer than the associated very poorly drained soils. Crop growth and yields are generally limited if the soils are not drained. Planting and harvesting are usually delayed.

Celina, Thackery, and Tremont soils are moderately well drained. These soils commonly include areas of wetter soils in seeps and swales and along drainageways. Surface and subsurface drains are effective in these wetter areas.

The design of both surface and subsurface drainage systems varies, depending on the type of soil and the availability of adequate outlets. A combination of surface drainage and subsurface drainage is needed in most areas of very poorly drained and somewhat poorly drained soils that are intensively row cropped. The drains in soils that have slow or very slow permeability should be spaced more closely than those in soils that are more permeable. Subsurface drainage is slow or very slow in Crosby and Milford soils. Open ditches commonly are used to remove surface water and serve as outlets for subsurface drains (fig. 2).

Organic soils oxidize and subside when the pore space is filled with air. Special drainage systems are needed in areas of these soils to control the depth and period of drainage. Lowering the water table during the cropping season to a level that permits good aeration of the root zone but still supplies the water needed by the plants and raising it to the surface during other times of the year can minimize the oxidation and subsidence of these wet soils.

Maintaining a drainage system is more economical than replacing the system. Seeding ditchbanks and berms helps to control streambank erosion and minimizes the slumping of banks. Filter strips seeded to a width of 10 feet or more also minimize the equipment limitations. Removing brush helps to prevent floodwater rising above the level of outlets for subsurface drains. Animal guards prevent animals from damaging subsurface drains and blocking the flow of water. Replacing broken drains keeps silt from accumulating on the bottom of the drains. Providing protection for banks underneath the drain outlets helps

Figure 1.—A grassed waterway constructed in a natural drainageway in an area of Lippincott silty clay loam.

to prevent erosion. Material used for bank protection can include rock, broken tile fragments, or grass.

Soil fertility is naturally relatively low in some of the sandy soils and in the eroded, more sloping soils. In addition, sandy soils retain only a small amount of plant nutrients; therefore, more frequent additions of fertilizers are needed. Soils that commonly are naturally more acid are Celina, Crosby, Ockley, Rush, Savona, Warsaw, Waupecan, and Waynetown soils. The more acid subsoil limits the availability of some plant nutrients. The content of organic matter is moderately low or low in Casco, Strawn, and Rodman soils and in nearly all of the eroded soils. The soils on flood plains, such as Genesee, Ross, Sloan, and Tremont soils, naturally have a higher content of plant nutrients than most of the upland soils. The content of organic matter is moderate or high in the soils on flood plains. The surface layer of many very poorly drained soils is very dark grayish brown or black. The content of organic matter is high or very high in these soils. Special fertilizer may be needed on some soils because of micronutrient deficiencies. Deficiencies may occur in soils that are sandy, have a low content of organic matter, or have a pH of less than 5.5 or more than 7.3. They may also occur in soils that have a surface layer of muck.

The effectiveness of nitrogen applied in the fall in areas of very poorly drained and somewhat poorly drained soils is reduced by leaching and denitrification. Incorporating fertilizer into the soil in gently sloping and sloping areas reduces the amount of soil lost through erosion. Applications of lime are necessary to raise the reaction of the surface layer to a level where most plant nutrients are readily available. On all of the soils, a balanced fertility program that includes adding lime and fertilizer should be based on the results of soil tests and plant analysis. Soil limitations other than fertility should be considered. The Cooperative Extension Service and private soil laboratories can help in determining the kinds and amounts of fertilizer to be applied.

Soil tilth is an important factor in the germination of

Figure 2.—Surface and subsurface drainage in a nearly level area of Kokomo silty clay loam.

seeds and in the infiltration of water into the soils. Soils that have good tilth are friable and porous. They can be worked easily, provide good seed contact, and allow for quick seedling emergence and strong root growth.

Many of the soils on uplands that are used as cropland have a surface layer of silt loam that has a moderate or moderately low content of organic matter. The surface of these soils generally crusts when it dries after a heavy rainfall. The crust is hard, is slow to absorb water, and fractures very little. It reduces the infiltration rate, retards seedling emergence, and increases the runoff rate. Regularly adding crop residue, manure, and other organic materials to the soil maintains or improves soil structure and minimizes crusting. Using minimum tillage or mulch tillage or incorporating crop residue into the surface layer also helps to prevent crusting. Allowing part of the residue to be exposed above the surface provides pathways for the movement of air and water.

Fall moldboard plowing is generally not the best practice on soils that have a surface layer of light

colored silt loam because the surface crusts in winter and spring. Many of these soils are nearly as dense and hard after fall moldboard plowing as they were before plowing. Moreover, soils that have slopes of more than 2 percent are more subject to erosion if they are moldboard plowed in the fall. A rough, irregular surface that leaves residue partially covered absorbs more water and dries faster than a smoothly tilled surface.

Some dark soils have a surface layer that contains more clay than that of most other soils in the county. Poor tilth is a problem because these soils tend to stay wet until late in spring. These soils can be tilled within only a narrow range in moisture content. If they are tilled when wet, the soils tend to be very cloddy and hard when dry. The cloddiness makes the preparation of a good seedbed difficult. Fall plowing allows winter freezing and drying to break up clods. Using mulch tillage and returning crop residue to the soil help to prevent crusting. These clayey soils generally crack when they dry. The cracks increase the rate of water infiltration (fig. 3).

Surface compaction occurs if the soils are tilled or harvested when wet or if they are subject to heavy traffic or heavy loads. Compaction can be prevented by tilling the soils at the proper soil moisture conditions, using minimum tillage, and planting deep-rooted legumes and grasses. Also, using four-wheel-drive tractors with flotation tires helps to minimize compaction. Surface compaction limits root growth, reduces water movement, and creates plowpans.

Irrigation is not used to a great extent in Clark County. Generally, rainfall is ample for crop moisture requirements. However, rainfall is commonly not timely or well distributed. During dry periods, supplemental irrigation could increase yields. Some of the soils in the county are suited to irrigation and can be irrigated if water is available. Eldean, Milton, Ockley, and Rush soils are especially well suited to irrigation.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. Corn and soybeans are the main row crops. Grain sorghum, sugar beets, sunflowers, navy beans, and similar crops can be grown. Economic conditions generally determine whether these crops are grown.

Wheat, rye, and oats are the most common close-growing crops. Alfalfa and grass-legume hay are also grown. The soils and climate are suited to barley, buckwheat, and flax and grass seed produced from bromegrass, fescue, timothy, and bluegrass.

Specialty crops grown commercially in the survey area are mainly apples, popcorn, potatoes, carrots, strawberries, and sweet corn. The acreage of such crops could be increased if economic conditions were favorable.

Eldean, Ockley, and Rush soils and soils that have slopes of less than 6 percent, have good natural drainage, and warm early in spring are especially well suited to vegetables and fruits. Crops can generally be planted and harvested earlier on these soils than on the other soils in the county.

Pasture and hayland make up about 7 percent of the acreage in Clark County (USDA, 1971). Most of the soils used as pasture and hayland are on hillsides adjacent to cultivated areas in the less sloping areas. Some of the pasture and hayland is in irregularly shaped areas of occasionally flooded soils. A few woodlots are also pastured, but woodlots generally provide grazing of poor quality because forage plants are sparse.

Most of the soils in the county are suited to the production of high-quality permanent pasture, although yields vary widely. The pasture and hayland generally support bluegrass and tall grasses, such as tall fescue, orchardgrass, and timothy. Some pastures are unimproved and require renovation and brush control.

The Genesee, Sloan, Tremont, and Ross soils on flood plains are potentially well suited to use as permanent pasture. Occasional flooding during the growing season is less damaging to pasture than to grain crops. These alluvial soils are fertile and have a high available water capacity, and potential pasture yields are high. Surface drains and subsurface drains are used to remove excess water on the very poorly drained Sloan soils, particularly if legumes are grown. Artificial drainage is generally not used on the better drained Genesee, Ross, and Tremont soils.

Soils in sloping to moderately steep areas are commonly eroded, are low in fertility, and have insufficient water available for plants because runoff is rapid. Forage production on these soils is low. Growth is good in the gently sloping areas of the same soils.

Overgrazing results in fields of weedy, low-producing forage and increases the hazard of erosion because of the sparse, short vegetative cover. Good management can restore the productivity of the pasture.

Surface compaction is caused by overgrazing or grazing when the soils are wet. It can greatly reduce the vigor of pasture plants. Also, it can increase the runoff rate and the hazard of erosion on sloping soils. Deferring grazing during wet periods minimizes compaction.

The successful establishment of forage crops requires the selection of species and varieties that are

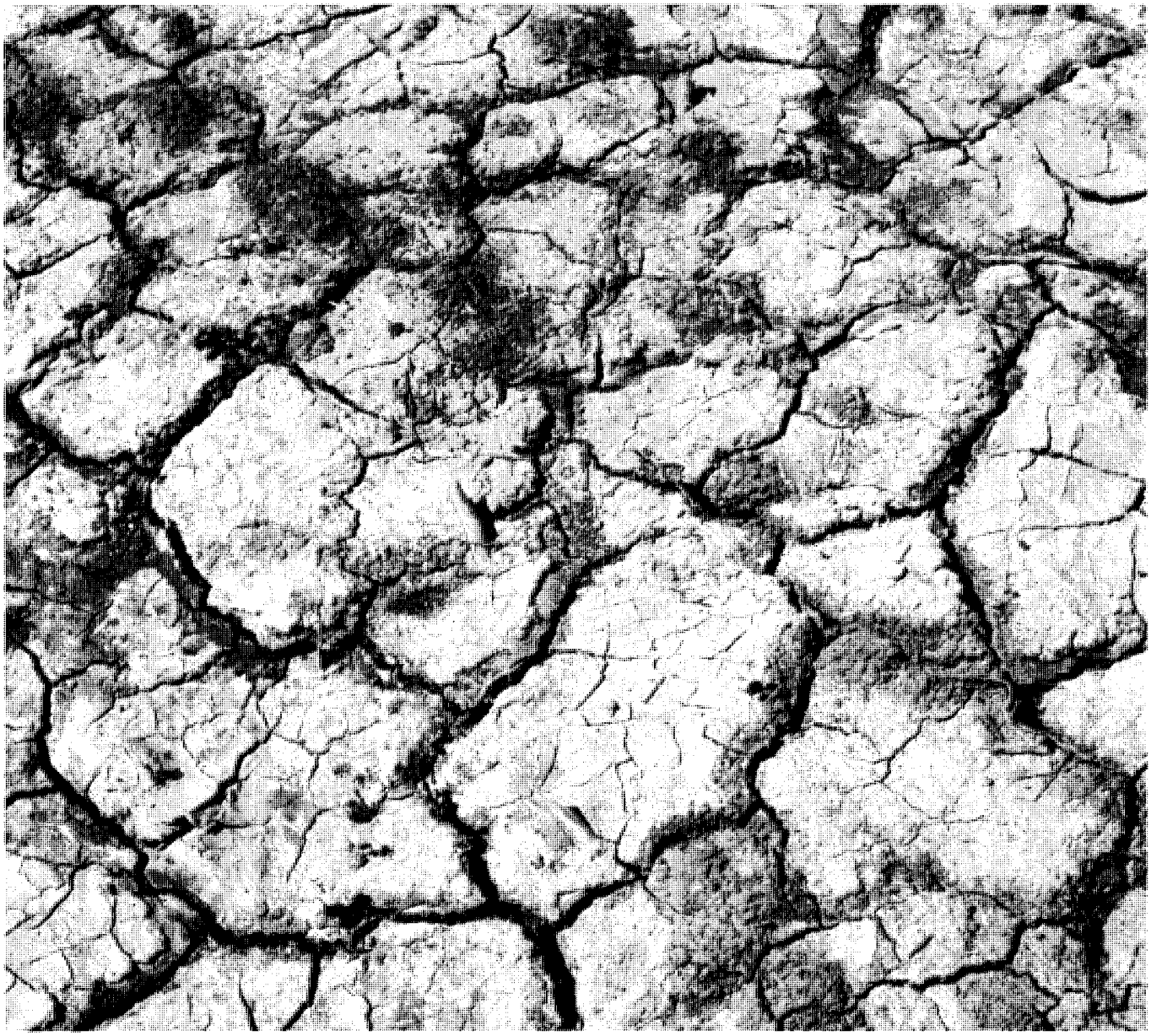

Figure 3.—Shrinkage causes cracks in the drying surface layer of Millsdale silty clay loam.

adapted to the soils. If the pasture is reseeded, proper seedbed preparation, proper seeding methods and seeding times, and proper applications of lime and fertilizer are needed. Forage renovation involves removing the existing grasses and weeds before the pasture is reseeded to the desired species. Removing the existing sod and leaving it on or near the surface as mulch help to control erosion. Nearly level pastures can be plowed. In gently sloping and strongly sloping areas, the pasture should be tilled and seeded on the contour.

No-till seeding is effective on most of the soils in Clark County, except for the wetter soils. Before this seeding method is applied, vegetation should be removed by grazing or by herbicide applications.

April and August are generally the best times for forage seeding. The forage can be seeded with a small grain crop. Because of plant competition for light, moisture, and nutrients, however, this method of seeding results in lower quality forage stands.

The selection of mixtures for seeding should be based on soil characteristics and on the desired pasture management system. Mixtures of grasses and legumes have a higher nutrient value than grass alone.

Legumes also provide nitrogen for improved grass growth. Alfalfa and red clover should be seeded on well drained soils. Ladino clover and alsike clover grow best on the wetter soils. Birdsfoot trefoil, bromegrass, lespedeza, warm-season grasses, and vetches are generally not grown as forage crops in Clark County, but they could be successfully included in a forage management system.

Applying lime and fertilizer according to the results of soil tests ensures good productivity and lengthens the life of the stand. Controlling weeds by mowing, clipping, and spraying is important for continued high production. Timely mowing is needed. Control of insects, such as alfalfa weevil and potato leafhopper, may be needed.

Harvesting hay or silage and grazing forage species at the proper stage of maturity are important for deriving the maximum nutritional value. The most current agronomy guide indicates the proper management of the forage species on a given farm.

Permanent pasture has fertility requirements similar to those of cropland. Lime and fertilizer should be applied at rates indicated by soil tests. The control of weeds by periodic mowing and by using recommended herbicides encourages the growth of desirable pasture plants. Controlled grazing helps to maintain pasture plants. The latest information on seeding mixtures, herbicide treatment, and other management for specific soils can be obtained from the local offices of the Cooperative Extension Service and the Natural Resources Conservation Service.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed soil map units in the survey area for crops are shown in table 3. The main concerns affecting the management of nonirrigated cropland are controlling soil blowing and water erosion, removing excess water, minimizing surface crusting and compaction, conserving moisture, and maintaining soil tilth, organic matter content, and fertility.

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

Surface or subsurface drainage or both are used to remove excess water, lower the seasonal high water table, and minimize ponding.

A surface crust forms in tilled areas after hard rains and may inhibit seedling emergence. Regular additions of crop residue, manure, or other organic materials improve soil structure and minimize crusting.

Tilling within the proper range in moisture content minimizes surface compaction.

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

Measures that are effective in maintaining soil tilth, organic matter content, and fertility include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the limitations and hazards shown in the table cannot be easily overcome. These are *flooding, depth to rock, ponding, slope,* and *limited organic matter content.*

Flooding.—Flooding can damage winter grain and forage crops. A tillage method that partly covers crop residue and leaves a rough or ridged surface helps to prevent removal of crop residue by floodwater. Tilling and planting should be delayed in the spring until flooding is no longer a hazard.

Depth to rock.—Rooting depth and available moisture may be limited by rock within a depth of 40 inches.

Ponding.—Surface drains help to remove excess surface water and minimize damage from ponding.

Slope.—Where the slope is more than 15 percent, water erosion and soil blowing may be accelerated unless conservation farming practices are applied. The selection of crops and the use of equipment are limited. Cultivation may be restricted.

Limited organic matter content.—Many soils that have a light colored surface layer have a low or moderately low organic matter content and weak or moderate structure. Regularly adding crop residue, manure, and other organic material to the soil maintains or improves the content of organic matter and soil structure.

Additional limitations and hazards are as follows:

Areas of rock outcrop and slick spots.—Farming around these areas may be feasible. Subsoiling or deep ripping soft sedimentary beds increases the effective rooting depth and the rate of water infiltration.

Excessive permeability.—This limitation causes deep leaching of nutrients and pesticides. The capacity of the soil to retain moisture for plant use is poor. Crops generally respond better to smaller, more frequent applications of fertilizer and lime than to one large application.

Potential for ground-water pollution.—This is a hazard in soils that have excessive permeability, hard bedrock, or a water table within the profile.

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

Short frost-free season.—If the growing season is less than 90 days, short-season crops or grasses should be grown.

Frost heave.—Frost heaving can damage deep-rooted legumes and some small grain crops.

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

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

Subsidence of organic matter.—Subsidence or shrinking occurs as a result of oxidation in the organic material after the soil is drained. Control of the water table by subirrigation through subsurface drain lines reduces the hazards of subsidence, burning, and soil blowing.

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

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

The following is an explanation of the criteria used to determine the limitations or hazards.

Areas of rock outcrop.—Rock outcrop is a named component of the map unit.

Areas of rubble land.—Rubble land is a named component of the map unit.

Areas of slick spots.—Slick spots are a named component of the map unit.

Depth to rock.—Bedrock is within a depth of 40 inches.

Easily eroded.—The surface K factor multiplied by the upper slope limit is more than 2 (same as prime farmland criteria).

Excessive permeability.—The upper limit of the permeability range is 6 inches or more within the soil profile.

Occasional flooding.—The component of the map unit is occasionally flooded.

Rare flooding.—The component of the map unit is subject to rare flooding.

Lime content.—The component is assigned to wind erodibility group 4L or has more than 5 percent lime in the upper 10 inches.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Ponding.—Ponding duration is assigned to the component of the map unit.

Potential for ground-water pollution.—The soil has an apparent water table within a depth of 4 feet or hard bedrock within the profile, or permeability is more than 6 inches per hour within the profile.

Poor tilth.—The component of the map unit is severely eroded, has less than 1 percent organic matter in the surface layer, or has more than 35 percent clay in the surface layer.

Fair tilth.—The component of the map unit has a surface layer of silty clay loam or gravelly loam.

Restricted permeability.—Permeability is 0.06 inch per hour or less within the profile.

Seasonal high water table.—The lower water table depth is less than 1.5 feet.

Salt content.—The component of the map unit has an electrical conductivity of more than 4 in the surface layer or more than 8 within a depth of 30 inches.

Short frost-free season.—The map unit has a growing season of less than 90 frost-free days.

Slope.—The upper slope range of the component of the map unit is more than 15 percent.

Sodium content.—The sodium adsorption ratio of the component of the map unit is more than 13 within a depth of 30 inches.

Soil blowing.—The wind erodibility index multiplied by the selected high C factor for the survey area and then divided by the T factor is more than 8 for the component of the map unit.

Surface rock fragments.—The terms describing the texture of the surface layer include any rock fragment modifier except for gravelly or channery, and "surface stones" is not already indicated as a limitation.

Surface crusting.—The organic matter content of

the surface layer is less than or equal to 3 percent and the texture is silt loam, loam, or silty clay loam.

Surface stones.—The terms describing the texture of the surface layer include any stony or bouldery modifier, or the soil is a stony or bouldery phase.

Surface compaction.—The component of the map unit has a surface layer of silt loam, silty clay loam, silty clay, or clay loam.

Frost heave.—The component of the map unit has a high potential for frost action.

Part of surface removed.—The surface layer of the component of the map unit is eroded.

Most of surface removed.—The surface layer of the component of the map unit is severely eroded.

Limited organic matter.—The content of organic matter in the surface layer of the component of the map unit is less than or equal to 3 percent.

Subsidence of organic matter.—The organic matter content of the surface layer of the component of the map unit is greater than or equal to 20 percent.

Crop Yield Estimates

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 4. 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 map units in the survey area also is shown in the table.

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

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

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

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

Pasture and Hayland Interpretations

Soils are assigned to pasture and hayland groups according to their suitability for the production of forage. The soils in each group are similar enough to be suited to the same species of grasses or legumes, have similar limitations and hazards, require similar management, and have similar productivity levels and other responses to management.

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

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

In the section "Interpretive Groups," the pasture and hayland suitability group symbol is listed for each soil. Soils assigned the same suitability group symbol require the same general management and have about the same potential productivity. The pasture and hayland suitability groups are based on soil characteristics and limitations.

Soils assigned to Group A have few limitations for the management and growth of climatically adapted plants. Those assigned to group A-1 are deep or very deep and are well drained. They have a surface layer of silt loam, silty clay loam, clay loam, or gravelly clay loam. The available water capacity ranges from low to high. These soils respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH in the subsoil can shorten the life of some deep-rooted legumes in the stand. Slopes range from 0 to 18 percent.

Soils in group A-2 are deep or very deep and are well drained. They have a surface layer of silt loam, silty clay loam, or clay loam. The available water capacity is low or moderate. These soils respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. The low pH of the subsoil can shorten the life of some

deep-rooted legumes in a stand. Slopes range from 12 to 30 percent. The slope may interfere with the mechanical application of lime and fertilizer and with clipping, mowing, and spraying for weed control. If the soils are overgrazed or cultivated for reseeding, the slope increases the hazard of erosion. These soils are suited to no-till reseedings and interseedings.

Soils in group A-4 are deep or moderately deep and are well drained. They have stones or boulders on the surface that are extensive enough to preclude the use of hay-making equipment. The soils have a surface layer of channery silt loam. The available water capacity is low. Slopes range from 18 to 70 percent.

Soils in group A-5 are very deep and are well drained or moderately well drained. They are subject to rare or occasional flooding. The flooding limits the use of these soils for pasture during periods of stream overflow, and sediment lowers the quality of the forage. These soils have a surface layer of silt loam or silty clay loam. The available water capacity is high or very high. Slopes are 0 to 2 percent.

Soils in group A-6 are very deep and are well drained and moderately well drained. They are subject to frost action. Frost action can damage legume stands. Mixing fibrous-rooted grasses with legumes and using proper grazing management measures help to prevent the damage caused by frost action. These soils have a surface layer of silt loam or silty clay loam. The available water capacity is moderate or high. Slopes range from 0 to 18 percent.

Soils in group B have limited potential for growth and production because of droughtiness. Those in group B-1 are very deep and are somewhat excessively drained. They have a surface layer of gravelly loam. The available water capacity is low. The soils are sandy or sandy-skeletal in the subsoil. Slopes range from 12 to 20 percent.

Soils in group B-2 are very deep and are excessively drained. They have a surface layer of gravelly loam. Growth and production are limited because of the very low available water capacity. These soils have a gravelly subsoil. Slopes range from 18 to 35 percent.

Soils in group C are wet because of a seasonal high water table. Those in group C-1 are very deep and are somewhat poorly drained or very poorly drained. They have a surface layer of silt loam, silty clay loam, or mucky silt loam. The available water capacity ranges from moderate to very high. These soils normally respond well to subsurface drainage. Slopes range from 0 to 6 percent.

Soils in group C-2 are moderately deep and are somewhat poorly drained or very poorly drained. They have a surface layer of silty clay loam or silt loam. The available water capacity is low. A seasonal high water table limits the rooting depth of deep-rooted forage plants. The rooting depth is also restricted by bedrock. Shallow-rooted species should be selected for planting in areas of these soils. Subsurface drains are used to lower the seasonal high water table. The effectiveness of subsurface drainage is typically limited by the restricted permeability in the subsoil, the depth to bedrock, or the landscape position of the soil. Forage crops that do not have a taproot can grow well in these soils. Slopes range from 0 to 2 percent.

Soils in group C-3 are very deep and are very poorly drained. They are subject to occasional flooding. The flooding limits the use of these soils for pasture during periods of stream overflow, and sediment lowers the quality of the forage. The soils have a surface layer of silt loam. The available water capacity is high. Slopes range from 0 to 2 percent. Frost action may damage legumes. Including grasses in a seeding mixture and using proper grazing management methods help to prevent the damage caused by frost action. The seasonal high water table limits the rooting depth of forage plants. Shallow-rooted species grow best in areas of these soils. Subsurface drains are used to lower the seasonal high water table. The effectiveness of subsurface drainage is limited by the landscape position of the soils.

Soils in group D are organic soils. Those in group D-1 are very deep and are very poorly drained. They formed entirely or partially in organic material. The available water capacity is high or very high. Slope is 0 to 2 percent.

Soils in group F have a restricted root zone. The root growth of climatically adapted plants is limited to a depth of 20 to 40 inches. Forage crops that do not have a taproot should be selected for planting in areas of these soils. Soils in group F-1 are moderately deep and are well drained. They have a surface layer of silt loam. The available water capacity is low. These soils are droughty. Warm-season grasses, such as switchgrass, big bluestem, indiangrass, and Caucasian bluestem, can be grown. The soils respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. The low pH in the subsoil of some soils can shorten the life of some deep-rooted legumes in a stand. Slopes range from 0 to 12 percent.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in table 4.

Land Capability Classification

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

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

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

Soils in classes V, VI, and VII are generally not suited to the mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class V to class VII. The local office of the Cooperative Extension Service or the Natural Resources Conservation Service can provide guidance on the use of these soils as cropland.

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

Capability subclasses identify the dominant kind of limitation in the class. They are designated by adding a small letter, *e, w, s,* or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness 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.

There are no subclasses in class I 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 mainly to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each land capability class and subclass is shown in table 5. The capability classification of map units in this survey area is given in table 4 and in the "Interpretive Groups" section.

Prime Farmland

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

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

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They either are used for food and fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf

courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

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

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

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

About 200,000 acres, or nearly 78 percent of the survey area, meets the requirements for prime farmland. Scattered areas of this land are throughout the county, but most areas are on ground moraines, in the valleys of the Mad River and the Little Miami River, and along secondary streams. This land is mainly in associations 5, 7, 8, 9, 10, 11, and 12, which are described in Part I under the heading "General Soil Map Units."

About 163,000 acres of the prime farmland in the county is used for crops. The crops grown on this land, mainly corn, wheat, and soybeans, account for an estimated two-thirds of the county's total agricultural income each year.

The map units in the survey area that meet the requirements for prime farmland are listed in table 6. On some soils included in the table, measures that overcome limitations are needed. The need for these measures is indicated in parentheses after the map unit name. The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units" in Part I. This list does not constitute a recommendation for a particular land use.

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high-quality crop when treated and managed by acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, and vegetables.

Unique farmland has an adequate supply of available moisture for the specific crops for which it is used because of stored moisture, precipitation, or irrigation and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favors the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and others.

Additional Farmland of Statewide Importance

Some areas other than areas of prime farmland and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate state agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states additional farmland of statewide importance may include tracts of land that have been designated for agriculture by state law.

Additional Farmland of Local Importance

This land consists of areas that are of local importance in the production of food, feed, fiber, forage, and oilseed crops and are not identified as having national or statewide importance. Where appropriate, this land is identified by local agencies. It may include tracts of land that have been designated for agriculture by local ordinance.

Lists of this land are developed as needed in cooperation with conservation districts and others.

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.

Windbreaks are often planted on land that did not originally support trees. Knowledge of how trees perform on such land can be gained only by observing and recording the performance of trees that have been planted and have survived. Many popular windbreak species are not indigenous to the areas in which they are planted.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil. Each tree or shrub has definable potential heights in a given physiographic area and under a given climate. Accurate definitions of potential heights are necessary when a windbreak is planned and designed.

Table 7 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in this table 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 Natural Resources Conservation Service or the Cooperative Extension Service or from a nursery.

Woodland

James Bartlett, service forester, Ohio Department of Natural Resources, Division of Forestry, helped prepare this section.

Nearly all of Clark County was forested at the time of the earliest land surveys. The climax forest communities were dominantly beech, oak-sugar maple, and mixed oak on uplands and elm-ash forests in the very poorly drained areas, such as areas of Lippincott and Sloan soils (Gordon, 1966).

In 1982, about 13,700 acres, or 5.5 percent of the county, was woodland (USDA, 1971). Most of this acreage is in small scattered woodlots on slopes along stream valleys, on flood plains, and in undrained areas on uplands. Most of the woodland has been cut over, and much of it has been grazed.

The potential for increased production of timber is high. If managed well, woodlots are capable of producing high-quality, rapidly growing native hardwoods. In addition, many woodlots could provide firewood, edible nuts, wildlife habitat, aesthetic value, and protection from strong winds.

Some kind of conservation treatment is needed on about 70 percent of the woodland in the county (USDA, 1971). The major management concerns are grazing of the woodland by livestock and inadequately stocked timber stands. Timber stand improvement practices, including culling diseased and less desirable trees and cutting and spraying vines, improve the growth rate of favored species. Harvesting mature trees benefits desirable trees by reducing competition and the potential of disease. Species selected for planting on open ground should be matched with the slope and soil type. Planting in established woods is seldom needed or advised. Fencing livestock out of the woods and providing fire protection help to maintain good stands.

Information on woodland management is available from the Ohio Department of Natural Resources, Division of Forestry; the Cooperative Extension Service; and the Natural Resources Conservation Service.

Table 8 can be used by woodland managers in planning the use of soils for woodland crops. Only the soils that are suitable for woodland crops are listed.

Woodland Ordination System

In table 8 and in the section "Interpretive Groups," the ordination symbol for each soil is listed. The ordination system is a nationwide uniform system of labeling soils or groups of soils that are similar in use and management. The primary factors evaluated in the woodland ordination system are productivity of the woodland overstory tree species and the principal soil properties resulting in hazards and limitations that affect woodland management. There are three parts of the ordination system—class, subclass, and group. The class and subclass are referred to as the ordination symbol.

Ordination Class Symbol

The first element of the ordination symbol is a number that denotes potential productivity in terms of cubic meters of wood per hectare per year for the indicator tree species. The larger the number, the greater the potential productivity. Potential productivity is based on site index and the corresponding culmination of mean annual increment. For example, the number 1 indicates a potential production of 1 cubic meter of wood per hectare per year (14.3 cubic feet per acre per year) and the number 10 indicates a potential production of 10 cubic meters of wood per hectare per year (143 cubic feet per acre per year).

The *indicator species* is a species that is common in the area and is generally, but not necessarily, the most productive on the soil. It is the species that determines the ordination class. It is the first species listed for a particular map unit in table 8.

Site index is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a

specified number of years. The index applies to fully stocked, even-aged, unmanaged stands. The site indexes shown in table 8 are averages based on measurements made at sites that are representative of the soil series. When the site index and woodland productivity of different soils are compared, the values for the same tree species should be compared. The higher the site index number, the more productive the soil is for that species. Site index values are used in conjunction with yield tables to determine average annual yields. Indirectly, they are used to determine the productivity class in the ordination class symbol.

Ordination Subclass Symbol

The second element of the ordination symbol, or subclass, is a capital letter that indicates certain soil or physiographic characteristics that contribute to important hazards or limitations to be considered in management. The subclasses are defined as follows:

Subclass X indicates that woodland use and management are limited by stones or rocks.

Subclass W indicates that woodland use and management are significantly limited by excess water, either seasonally or throughout the year. Restricted drainage, a high water table, or flooding can adversely affect either stand development or management.

Subclass T indicates that the root zone has toxic substances. Excessive alkalinity, acidity, sodium salts, or other toxic substances impede the development of desirable species.

Subclass D indicates that woodland use and management are limited by a restricted rooting depth. The rooting depth is restricted by hard bedrock, a hardpan, or other restrictive layers in the soil.

Subclass C indicates that woodland use and management are limited by the kind or amount of clay in the upper part of the soil.

Subclass S indicates that the soil is sandy, has a low available water capacity, and normally has a low content of available plant nutrients. The use of equipment is limited during dry periods.

Subclass F indicates that woodland use and management are limited by a high content of rock fragments that are larger than 2 millimeters and smaller than 10 inches. This subclass includes flaggy soils.

Subclass R indicates that woodland use and management are limited by excessive slope.

Subclass A indicates that no significant limitations affect woodland use and management.

Woodland Management and Productivity

In table 8, the soils are rated for erosion hazard, equipment limitation, seedling mortality, windthrow hazard, and plant competition.

The *erosion hazard* is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive soil loss.

The *equipment limitation* is *slight* if the use of equipment is not limited to a particular kind of equipment or time of year, *moderate* if there is a short seasonal limitation or a need for some modification in the management of equipment, and *severe* if there is a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings are for seedlings that are from a good planting stock and that are properly planted during a period of average rainfall. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate,* 25 to 50 percent; and *severe,* more than 50 percent.

The *windthrow hazard* is *slight* if trees in wooded areas are not expected to be blown down by commonly occurring winds, *moderate* if some trees are blown down during periods of excessive soil wetness and strong winds, and *severe* if many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Plant competition is *slight* if there is little or no competition from other plants, *moderate* if plant competition is expected to hinder the development of a fully stocked stand of desirable trees, and *severe* if plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed for the control of undesirable plants.

The potential productivity of merchantable or *common trees* is expressed as a site index, which is described under the heading "Ordination Class Symbol." 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 column *trees to plant* in table 8 lists trees that are suitable for commercial wood production and that are suited to the soils.

Recreation

The soils in Clark County generally are moderately well suited to recreational development. The soils dominantly are very deep, are nearly level and gently sloping, and do not have many large stones or a high content of small stones. Most are not subject to flooding and do not have a clayey or sandy surface layer. Many wooded and hilly areas along stream valleys can provide scenic areas for camping, hiking, picnicking, and many other forms of outdoor activities. Well drained soils on flood plains have good potential for use as nature study areas, picnic areas, and paths and trails. The soils that are best suited to recreational development are in associations 1, 2, 4, and 11, which are described in Part I under the heading "General Soil Map Units."

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites, and either access to public sewer lines or the capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degrees, for recreational uses by the duration of flooding and the season when it occurs. Onsite assessment of the height, duration, intensity, and frequency of flooding is essential in planning recreational facilities.

Camp areas are tracts of land used intensively as sites for tents, trailers, and campers and for outdoor activities that accompany such sites. These 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 soils are rated on the basis of soil properties that influence the ease of developing camp areas and performance of the areas after development. Also considered are the soil properties that influence trafficability and promote the growth of vegetation after heavy use.

Picnic areas are natural or landscaped tracts of land that are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation after development. The surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Playgrounds are areas used intensively for baseball, football, or similar activities. These areas require nearly level soils that are free of stones and that can withstand heavy foot traffic and maintain an adequate cover of vegetation. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation. Slope and stoniness are the main concerns in developing playgrounds. The surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Paths and trails are areas used for hiking and horseback riding. The areas should require little or no cutting and filling during site preparation. The soils are rated on the basis of soil properties that influence trafficability and erodibility. Paths and trails should remain firm under foot traffic and not be dusty when dry.

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.

The interpretive ratings in this table help engineers, planners, and others understand how soil properties influence recreational uses. Ratings for proposed uses are given in terms of limitations. Only the most restrictive features are listed. Other features may limit a specific recreational use.

The degree of soil limitation is expressed as slight, moderate, or severe.

Slight means that soil properties are favorable for

the rated use. The limitations are minor and can be easily overcome. Good performance and low maintenance are expected.

Moderate means that soil properties are moderately favorable for the rated use. The limitations can be overcome or modified by special planning, design, or maintenance. During some part of the year, the expected performance may be less desirable than that of soils rated *slight*.

Severe means that soil properties are unfavorable for the rated use. Examples of limitations are slope, bedrock near the surface, flooding, and a seasonal high water table. These limitations generally require major soil reclamation, special design, or intensive maintenance. Overcoming the limitations generally is difficult and costly.

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

Wildlife Habitat

Lynn T. Holtzman, private lands biologist, Ohio Department of Natural Resources, Division of Wildlife, helped prepare this section.

Wildlife habitat is directly related to soil and land use. Quality, type, and abundance of habitat limit the species and populations in an area. Many species of wildlife exist in Clark County, and most have varied in numbers over the years because of changes in land use. Cottontail rabbits, bobwhite quail, ring-necked pheasants, eastern meadowlarks, and bobolinks were once among the most abundant upland wildlife species. Populations of these species have declined recently, however, because of changes in land use, mainly farming practices. The conversion of pasture and hayland to row crop production, the removal of fencerows, and intensified cropping systems have contributed to the loss of upland wildlife habitat. White-tailed deer populations have increased in recent years, resulting partly from the availability of old pastures and woodlots that are no longer being grazed by livestock. Furbearers, such as red fox, gray fox, raccoon, skunks, opossum, and muskrat, are also relatively abundant. Many species of resident and migratory birds nest in the county. In addition, a few rare wildlife species, such as the spotted turtle and massasauga rattlesnake, also are in the survey aea.

Many areas in the valleys of the Mad River and the Little Miami River and their tributaries provide excellent habitat for all types of wildlife commonly found in the area. These areas also provide habitat and staging areas during waterfowl migration. If proper management is applied, all of the soils in Clark County can be used to provide food and cover for wildlife. Habitat for openland, wetland, and woodland wildlife can be incorporated into a single area to attract the widest variety of wildlife species.

Habitat for wetland wildlife can be further developed in undrained depressions and in old stream meanders on flood plains. Ponds and marshes provide habitat for songbirds, waterfowl, shore birds, and wetland furbearers. Special plantings help to attract waterfowl. Water level management can be incorporated in some of these areas to further enhance the value to wildlife.

Most of the upland soils in the county are well suited to plants that are valuable as wildlife food and cover. Grassland nesting areas are especially critical. Planting grasses and legumes helps to create these areas. Additional nesting cover can be provided by delaying the mowing of odd areas, such as ditch berms, roadsides, field edges, and pastures, until after August 1 of each year. Also, fruit-bearing shrubs can be planted in hedgerows and field borders to provide winter cover and food. Managing for food-producing trees and leaving hollow den trees improve woodlots as wildlife habitat. Cropland can also be valuable as wildlife habitat if managed properly.

Eroded soils can be developed into habitat for upland wildlife by planting grasses and legumes and shrubs. These plantings provide food and cover and help to control erosion.

Field windbreaks and shelterbelts around farm buildings can provide food and cover for wildlife if composed of suitable plant species. Creating special habitat through the use of artificial nesting structures, feeding stations, food patches, and wildflowers can attract specific songbirds.

Additional information on the development of wildlife habitat is available from the Ohio Department of Natural Resources, Division of Wildlife; the State game protector; or the Natural Resources Conservation Service.

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. If food, cover, or water is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area.

If the soils have potential for habitat development, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants. In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife.

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

Figure 4.—Areas of Sloan soils provide good habitat for wetland wildlife.

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.

Elements of Wildlife Habitat

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants used by wildlife. Examples are wheat, rye, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes planted for wildlife food and cover. Examples are fescue, bromegrass, timothy, orchardgrass, clover, alfalfa, trefoil, reed canarygrass, and crownvetch.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Examples are bluestem, indiangrass, blueberry, goldenrod, lambsquarters, dandelions, blackberry, ragweed, wheatgrass, fescue, and nightshade.

The major soil properties affecting the growth of grain and forage crops and wild herbaceous plants are depth of the root zone, texture of the surface layer, the amount of water available to plants, wetness, and flooding. The length of the growing season also is important.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage that wildlife eat. Examples are oak, poplar, boxelder, birch, maple, green ash, willow, and American elm. Examples of fruit-producing shrubs that are suitable for planting on soils that have good potential for these plants are hawthorn, honeysuckle, American plum, redosier dogwood, chokecherry, serviceberry, silver buffaloberry, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover that provide habitat or supply food in the form of browse, seed, or fruitlike cones. Examples are pine, spruce, hemlock, fir, yew, cedar, larch, and juniper.

The major soil properties affecting the growth of hardwood and coniferous trees and shrubs are depth of the root zone, the amount of water available to plants, and wetness.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Wetland plants produce food or cover for wetland wildlife. Examples of these plants are smartweed, wild millet, rushes, sedges, bulrushes, wild rice, arrowhead, waterplantain, pickerelweed, and cattail.

The major soil properties affecting wetland plants are texture of the surface layer, wetness, acidity or alkalinity, and slope.

Shallow water areas have an average depth of less than 5 feet. They are useful as habitat for some wildlife species. They are naturally wet areas or are created by dams, levees, or water-control measures in marshes or streams. Examples are muskrat marshes, waterfowl feeding areas, wildlife watering developments, beaver ponds, and other wildlife ponds.

The major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability.

Kinds of Wildlife Habitat

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, and shrubs. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include pheasant, quail, meadowlark, field sparrow, killdeer, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of hardwoods or conifers or a mixture of these and associated grasses, legumes, and wild herbaceous plants. The wildlife attracted to this habitat include thrushes, woodpeckers, owls, tree squirrels, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas that support water-tolerant plants (fig. 4). The wildlife attracted to this habitat include ducks, geese, herons, bitterns, rails, kingfishers, muskrat, otter, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the 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 should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 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 kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features generally are 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 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, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 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 generally are 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, potential for frost action, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. It also shows the suitability of the soils for use as a daily cover for landfill.

Soil properties are important in selecting sites for sanitary facilities and in identifying limiting soil properties and site features to be considered in planning, design, and installation. Soil limitation ratings of *slight, moderate,* or *severe* are given for septic tank absorption fields, sewage lagoons, and trench and area sanitary landfills. Soil suitability ratings of *good, fair,* and *poor* are given for daily cover for landfill.

A rating of *slight* or *good* indicates that the soils have no limitations or that the limitations can be easily overcome. Good performance and low maintenance can be expected. A rating of *moderate* or *fair* indicates that the limitations should be recognized but generally can be overcome by good management or special design. A rating of *severe* or *poor* indicates that overcoming the limitations is difficult or impractical. Increased maintenance may be required.

Septic tank absorption fields are areas in which subsurface systems of tile or perforated pipe distribute effluent from a septic tank into the natural soil. The centerline of the tile is assumed to be at a depth of 24 inches. Only the part of the soil between depths of 24 and 60 inches is considered in making the ratings. The soil properties and site features considered are those that affect the absorption of the effluent, those that affect the construction and maintenance of the system, and those that may affect public health.

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, relatively impervious soil material. Aerobic lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Relatively impervious soil material for the lagoon floor and sides is desirable to minimize seepage and contamination of local ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in 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.

Trench sanitary landfill is an area where solid waste is disposed of by placing refuse in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil that is excavated from the trench. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. Soil properties that influence the risk of pollution, the ease of excavation, trafficability, and revegetation are the major considerations in rating the soils.

Area sanitary landfill is an area where solid waste is disposed of by placing refuse in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil that is imported from a source away from the site. A final cover of soil at least 2 feet thick is placed over the completed landfill. Soil properties that influence trafficability, revegetation, and the risk of pollution are the main considerations in rating the soils for area sanitary landfills.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The suitability of a soil for use as cover is based on properties that affect workability and the ease of digging, moving, and spreading the material over the refuse daily during both wet and dry periods.

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.

Waste Management

Soil properties are important when organic waste is applied as fertilizer and wastewater is applied in irrigated areas. They also are important when the soil is used as a medium for the treatment and disposal of the organic waste and wastewater. Unfavorable soil properties can result in environmental damage.

The use of organic waste and wastewater as production resources results in energy and resource conservation and minimizes the problems associated with waste disposal. If disposal is the goal, applying a maximum amount of the organic waste or the wastewater to a minimal area holds costs to a minimum and environmental damage is the main hazard. If reuse is the goal, a minimum amount should be applied to a maximum area and environmental damage is unlikely.

Interpretations developed for waste management may include ratings for manure- and food-processing waste, municipal sewage sludge, use of wastewater

for irrigation, and treatment of wastewater by slow rate, overland flow, and rapid infiltration processes.

Specific information regarding waste management is available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In the 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 to 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, a 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 a 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 one or more of the following characteristics: a plasticity index of more than 10, a high shrink-swell potential, many stones, slopes of more than 25 percent, or a water table at a depth of 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. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity in or below the soil 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 as much as 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 high water table at or near the surface.

The surface layer of most soils generally is preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features generally are 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 table 14, 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 more than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

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

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

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 the potential for 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. 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 control 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 to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

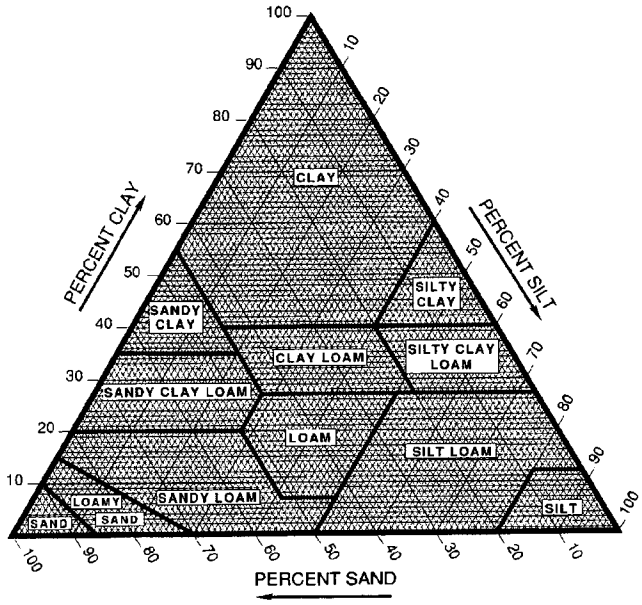

Figure 5.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given in the soil series descriptions in Part I of this survey.

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. 5). "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 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 (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

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, SP-SM.

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

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

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

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

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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 in the soil series descriptions in Part I of this survey.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. 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, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving 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 table 16, 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 and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each 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.

Cation-exchange capacity is 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. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

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

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 classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. The soil properties that influence erodibility are those that affect the infiltration rate, the movement of water through the soil, and the water storage capacity of the soil and those that allow the soil to resist dispersion, splashing, abrasion, and the transporting forces of rainfall and runoff. The most important soil properties are the content of silt plus very fine sand, the content of sand coarser than very fine sand, the content of organic matter, soil structure, and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion.

Erosion factor Kf is one of the factors used in the Revised Universal Soil Loss Equation (RUSLE) to predict the average rate of soil loss by sheet and rill erosion in tons per acre per year. It shows the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Ratings of 1 to 5 are used, depending on soil properties and prior erosion. The criteria used in assigning a T factor to a soil include maintenance of an adequate rooting depth for crop production, potential reduction of crop yields, maintenance of water-control structures affected by sedimentation, prevention of gullying, and the value of nutrients lost through erosion.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. Wind erodibility is directly related to the percentage of dry, nonerodible surface soil aggregates larger than 0.84 millimeter in diameter. Soils are assigned to wind erodibility groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 millimeter. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils generally are not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.
3. Coarse sandy loams, 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 loams, silt loams, clay loams, and silty clay loams that have more than 5 percent finely divided calcium carbonate. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous 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. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils have less than 5 percent finely divided calcium carbonate. They are moderately erodible. Crops can be grown if measures to control soil blowing are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils have less than 5 percent finely divided calcium carbonate. They are moderately erodible. Crops can be grown if ordinary measures to control soil blowing are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils have less than 5 percent finely divided calcium carbonate. They are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in 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 Features

Table 17 gives estimates of several important soil features used in land use planning that involves engineering considerations. These features are described in the following paragraphs.

Depth to bedrock is given if bedrock is within a depth of 60 inches. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as 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.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential 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.

A *low* potential for frost action indicates that the soil is rarely susceptible to the formation of ice lenses; a *moderate* potential indicates that the soil is susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength; and a *high* potential indicates that the soil is highly susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength.

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 results in a severe hazard of corrosion. 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.

Water Features

Table 18 gives estimates of several important water features used in land use planning that involves engineering considerations. These features are described in the following paragraphs.

Hydrologic soil groups are groups of soils that, when saturated, have the same runoff potential under similar storm and ground cover conditions. The soil properties that affect the runoff potential are those that influence the minimum rate of infiltration in a bare soil after prolonged wetting and when the soil is not frozen. These properties include the depth to a seasonal high water table, the infiltration rate, permeability after prolonged wetting, and the depth to a very slowly permeable layer. The influences of ground cover and slope are treated independently and are not taken into account in hydrologic soil groups.

In the definitions of the hydrologic soil groups, the infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The transmission rate is the rate at which water moves through the soil and is controlled by properties of the soil layers.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of very 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 a moderately fine 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 that have a moderately fine 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 clayey soils 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 covering of the soil surface by flowing water, is caused by overflow from streams or by runoff from adjacent slopes. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in marshes and swamps or in closed depressions is considered to be ponding.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur. Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable; *rare* that it is unlikely but is possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year).

Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 to 30 days), and *very long* (more than 30 days). The time of year that flooding is most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and level 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 a zone of saturation at the highest average depth during the wettest season. It is at least 6 inches thick, persists in the soil for more than a few weeks, and is within 6 feet of the surface. Indicated in table 18 are the depth to the

seasonal high water table, the kind of water table, and the months of the year when the water table usually is highest.

An *apparent* water table is indicated by the level at which water stands in a freshly dug, unlined borehole after adequate time for adjustments in the surrounding soil. A *perched* water table is one that is above an unsaturated zone in the soil. The basis for determining that a water table is perched may be general knowledge of the area. The water table is proven to be perched if the water level in a borehole is observed to fall when the borehole is extended.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. *Ponding duration* classes are the same as those for flooding. *Maximum ponding depth* refers to the depth of the water above the surface of the soil.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bottom land. The normal flood plain of a stream, subject to flooding.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material or 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 establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric

layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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 wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field*

capacity, normal moisture capacity, or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Footslope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

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. 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. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or

unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Kame terrace. A terracelike ridge consisting of stratified sand and gravel that were deposited by a meltwater stream flowing between a melting glacier and a higher valley wall or lateral moraine and that remained after the disappearance of the ice. It is commonly pitted with kettles and has an irregular ice-contact slope.

Krotovinas. Irregular tubular streaks within one layer of material transported from another layer. Caused by the filling of tunnels made by burrowing animals in one layer with material from outside the layer. They appear as rounded or elliptical volumes of various sizes. They may have colors contrasting (light or dark) with those of the layer in which they appear, and their texture and structure may be unlike those of the soil around them.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A surface marking the floor of an extinct

lake, filled in by well sorted, stratified sediments.

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.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

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, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Oxbow. The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The

rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

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 or very 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.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Recessional moraine. A moraine formed during a temporary but significant halt in the retreat of a glacier.

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 generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riser. The relatively short, steeply sloping area below a terrace tread that grades to a lower terrace tread or base level.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. Exposures of bare bedrock other than lava flows and rock-lined pits.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in

diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The uppermost inclined surface at the top of a hillside. It is the transition zone from the backslope to the summit of a hill or mountain. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

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 refill (in tables). The slow filling of ponds, resulting from restricted permeability in 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.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summit. A general term for the top, or highest level, of an upland feature, such as a hill or mountain. It commonly refers to a higher area that has a gentle slope and is flanked by steeper slopes.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The outermost inclined surface at the base of a hill; part of a footslope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The relatively flat terrace surface that was cut or built by stream or wave action.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

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.--Classification of the Soils

(This classification does not include recent amendments to soil taxonomy for cation-exchange activity, particle-size modifier, and dual mineralogy for strongly contrasting classes. More detailed information is available at local offices of the Natural Resources Conservation Service)

Soil name	Family or higher taxonomic class
Adrian	Terric Medisaprists, sandy or sandy-skeletal, mixed, euic, mesic
Carlisle	Typic Medisaprists, euic, mesic
Casco	Typic Hapludalfs, fine-loamy over sandy or sandy-skeletal, mixed, mesic
Celina	Aquic Hapludalfs, fine, mixed, mesic
Crosby	Aeric Ochraqualfs, fine, mixed, mesic
Donnelsville	Eutrochreptic Rendolls, loamy-skeletal, carbonatic, mesic
Drummer	Typic Haplaquolls, fine-silty, mixed, mesic
Eldean	Typic Hapludalfs, fine, mixed, mesic
Genesee	Fluventic Eutrochrepts, fine-loamy, mixed, mesic
Kokomo	Typic Argiaquolls, fine, mixed, mesic
Linwood	Terric Medisaprists, loamy, mixed, euic, mesic
Lippincott	Typic Argiaquolls, fine, mixed, mesic
Miamian	Typic Hapludalfs, fine, mixed, mesic
Milford	Typic Haplaquolls, fine, mixed, mesic
Millsdale	Typic Argiaquolls, fine, mixed, mesic
Milton	Typic Hapludalfs, fine, mixed, mesic
Ockley	Typic Hapludalfs, fine-loamy, mixed, mesic
Patton	Typic Haplaquolls, fine-silty, mixed, mesic
Randolph	Aeric Ochraqualfs, fine, mixed, mesic
Rodman	Typic Hapludolls, sandy-skeletal, mixed, mesic
Ross	Cumulic Hapludolls, fine-loamy, mixed, mesic
Rush	Typic Hapludalfs, fine-silty, mixed, mesic
Savona	Aeric Ochraqualfs, fine, mixed, mesic
Sloan	Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic
Strawn	Typic Hapludalfs, fine-loamy, mixed, mesic
Thackery	Aquic Hapludalfs, fine-loamy, mixed, mesic
Tremont	Cumulic Haplaquolls, fine-loamy, mixed (calcareous), mesic
Udorthents	Typic Udorthents, fine-loamy, mixed, mesic
Wallkill	Thapto-Histic Fluvaquents, fine-loamy, mixed, nonacid, mesic
Warsaw	Typic Argiudolls, fine-loamy over sandy or sandy-skeletal, mixed, mesic
Waupecan	Typic Argiudolls, fine-silty, mixed, mesic
Waynetown	Aeric Ochraqualfs, fine-silty, mixed, mesic
Westland	Typic Argiaquolls, fine-loamy, mixed, mesic

Table 2.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
Ad	Adrian muck, drained	803	0.3
Ae	Adrian muck, undrained	247	*
Ca	Carlisle muck, drained	125	*
Cb	Carlisle muck, undrained	509	0.2
CcD2	Casco gravelly loam, 12 to 20 percent slopes, eroded	534	0.2
CeA	Celina silt loam, 0 to 2 percent slopes	6,546	2.5
CeB	Celina silt loam, 2 to 6 percent slopes	5,569	2.2
ChA	Celina-Strawn complex, 0 to 2 percent slopes	2,518	1.0
ChB	Celina-Strawn complex, 2 to 6 percent slopes	4,553	1.8
CrA	Crosby silt loam, 0 to 2 percent slopes	20,979	8.2
CrB	Crosby silt loam, 2 to 6 percent slopes	632	0.2
DoE	Donnelsville channery silt loam, 18 to 30 percent slopes	239	*
DpF	Donnelsville-Rock outcrop complex, 30 to 70 percent slopes	280	0.1
Dr	Drummer silty clay loam, gravelly substratum	3,733	1.5
EmA	Eldean silt loam, 0 to 2 percent slopes	9,310	3.6
EmB	Eldean silt loam, 2 to 6 percent slopes	5,442	2.1
EmB2	Eldean silt loam, 2 to 6 percent slopes, eroded	1,517	0.6
EmC2	Eldean silt loam, 6 to 12 percent slopes, eroded	778	0.3
EnC2	Eldean-Casco complex, 6 to 12 percent slopes, eroded	311	0.1
EpB2	Eldean-Miamian complex, 2 to 6 percent slopes, eroded	3,305	1.3
EpC2	Eldean-Miamian complex, 6 to 12 percent slopes, eroded	6,206	2.4
EpC3	Eldean-Miamian complex, 6 to 12 percent slopes, severely eroded	1,236	0.5
EpD2	Eldean-Miamian complex, 12 to 18 percent slopes, eroded	3,355	1.3
EpD3	Eldean-Miamian complex, 12 to 18 percent slopes, severely eroded	550	0.2
EpE2	Eldean-Miamian complex, 18 to 30 percent slopes, eroded	580	0.2
EsE3	Eldean-Rodman complex, 18 to 30 percent slopes, severely eroded	212	*
EuB	Eldean-Urban land complex, 2 to 6 percent slopes	1,655	0.6
EuC	Eldean-Urban land complex, 6 to 12 percent slopes	697	0.3
Ge	Genesee silt loam, till substratum, rarely flooded	246	*
Gn	Genesee silt loam, till substratum, occasionally flooded	1,637	0.6
Ko	Kokomo silty clay loam	37,430	14.6
Lg	Linwood muck, undrained	166	*
Lh	Linwood mucky silt loam, drained	809	0.3
Lm	Lippincott mucky silt loam	616	0.2
Lp	Lippincott silty clay loam	8,655	3.4
Lu	Lippincott-Urban land complex	237	*
MgB2	Miamian silty clay loam, limestone substratum, 2 to 6 percent slopes, eroded	496	0.2
MgC2	Miamian silty clay loam, limestone substratum, 6 to 12 percent slopes, eroded	102	*
MgE2	Miamian silty clay loam, limestone substratum, 18 to 30 percent slopes, eroded	190	*
MhA	Miamian silt loam, 0 to 2 percent slopes	3,888	1.5
MhB	Miamian silt loam, 2 to 6 percent slopes	20,418	7.9
MhB2	Miamian silt loam, 2 to 6 percent slopes, eroded	5,122	2.0
MhC	Miamian silt loam, 6 to 12 percent slopes	1,406	0.5
MhC2	Miamian silt loam, 6 to 12 percent slopes, eroded	949	0.4
MhD2	Miamian silt loam, 12 to 18 percent slopes, eroded	394	0.2
MhE	Miamian silt loam, 18 to 30 percent slopes	773	0.3
MhE2	Miamian silt loam, 18 to 30 percent slopes, eroded	683	0.3
MkB2	Miamian silty clay loam, 2 to 6 percent slopes, eroded	7,892	3.1
MkC2	Miamian silty clay loam, 6 to 12 percent slopes, eroded	5,201	2.0
MkD2	Miamian silty clay loam, 12 to 18 percent slopes, eroded	1,230	0.5
MmC3	Miamian clay loam, 6 to 12 percent slopes, severely eroded	2,719	1.1
MmD3	Miamian clay loam, 12 to 18 percent slopes, severely eroded	871	0.3
MmE3	Miamian clay loam, 18 to 30 percent slopes, severely eroded	663	0.3
MnB	Miamian-Urban land complex, 2 to 6 percent slopes	2,635	1.0
MnC	Miamian-Urban land complex, 6 to 12 percent slopes	245	*
Mo	Milford silty clay loam, sandy substratum	2,293	0.9
Ms	Millsdale silty clay loam	1,215	0.5
MtA	Milton silt loam, 0 to 2 percent slopes	463	0.2
MtB	Milton silt loam, 2 to 6 percent slopes	877	0.3
MvC2	Milton silty clay loam, 6 to 12 percent slopes, eroded	500	0.2
MxB	Milton-Urban land complex, 2 to 6 percent slopes	469	0.2
OcA	Ockley silt loam, 0 to 2 percent slopes	5,044	2.0

See footnote at end of table.

Table 2.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
OcB	Ockley silt loam, 2 to 6 percent slopes	641	0.2
Pa	Patton silty clay loam	530	0.2
Pg	Pits, gravel	530	0.2
Ph	Pits, quarry	182	*
RaA	Randolph silt loam, 0 to 2 percent slopes	350	0.1
RgE	Rodman gravelly loam, 18 to 35 percent slopes	1,845	0.7
Rn	Ross silt loam, occasionally flooded	2,385	0.9
Ro	Ross silty clay loam, rarely flooded	690	0.3
RuA	Rush silt loam, 0 to 2 percent slopes	1,756	0.7
ScA	Savona silt loam, 0 to 2 percent slopes	844	0.3
So	Sloan silt loam, sandy substratum, occasionally flooded	5,676	2.2
StB2	Strawn silty clay loam, 2 to 6 percent slopes, eroded	9,246	3.6
StC2	Strawn silty clay loam, 6 to 12 percent slopes, eroded	5,650	2.2
StD2	Strawn silty clay loam, 12 to 18 percent slopes, eroded	1,408	0.5
StE2	Strawn silty clay loam, 18 to 35 percent slopes, eroded	37	*
SuA	Strawn-Crosby complex, 0 to 2 percent slopes	2,355	0.9
SuB	Strawn-Crosby complex, 2 to 6 percent slopes	1,421	0.6
ThA	Thackery silt loam, 0 to 2 percent slopes	1,259	0.5
Tr	Tremont silty clay loam, rarely flooded	1,398	0.5
Ts	Tremont silt loam, occasionally flooded	2,684	1.0
Ud	Udorthents, loamy	1,443	0.6
Ur	Urban land	1,176	0.5
W	Water	3,595	1.4
Wc	Wallkill silt loam, occasionally flooded	258	0.1
WeA	Warsaw silt loam, 0 to 3 percent slopes	1,168	0.5
WpA	Waupecan silt loam, 0 to 2 percent slopes	1,226	0.5
WrA	Waynetown silt loam, 0 to 2 percent slopes	989	0.4
Wt	Westland silty clay loam	7,186	2.8
	Total	256,883	100.0

* Less than 0.05 percent. The combined extent of the soils assigned an asterisk in the "Percent" column is about 0.9 percent of the survey area.

Table 3.--Main Cropland Limitations and Hazards

(See text for a description of the limitations and hazards listed in this table. Only the soils suitable for cultivated crops are listed)

Map symbol and soil name	Cropland limitations or hazards
Ad:	
Adrian	Excessive permeability
	Frost heave
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Subsidence of organic matter
Ca:	
Carlisle	Frost heave
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Subsidence of organic matter
CeA:	
Celina	Frost heave
	Limited organic matter content
	Surface compaction
	Surface crusting
CeB:	
Celina	Easily eroded
	Frost heave
	Limited organic matter content
	Surface compaction
	Surface crusting
ChA:	
Celina	Frost heave
	Limited organic matter content
	Surface compaction
	Surface crusting
Strawn	Limited organic matter content
	Surface compaction
	Surface crusting
ChB:	
Celina	Easily eroded
	Frost heave
	Limited organic matter content
	Surface compaction
	Surface crusting
Strawn	Easily eroded
	Fair tilth
	Limited organic matter content
	Surface compaction
	Surface crusting
CrA:	
Crosby	Frost heave
	Limited available water capacity
	Limited organic matter content
	Restricted permeability
	Seasonal high water table
	Surface compaction
	Surface crusting

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
CrB:	
Crosby	Easily eroded Frost heave Limited available water capacity Limited organic matter content Restricted permeability Seasonal high water table Surface compaction Surface crusting
Dr:	
Drummer	Excessive permeability Fair tilth Frost heave Ponding Potential for ground-water pollution Seasonal high water table Surface compaction
EmA:	
Eldean	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water pollution Surface compaction Surface crusting
EmB:	
Eldean	Easily eroded Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water pollution Surface compaction Surface crusting
EmB2:	
Eldean	Easily eroded Excessive permeability Limited available water capacity Limited organic matter content Part of surface removed Potential for ground-water pollution Surface compaction Surface crusting
EmC2:	
Eldean	Easily eroded Excessive permeability Limited available water capacity Limited organic matter content Part of surface removed Potential for ground-water pollution Surface compaction Surface crusting
EnC2:	
Eldean	Easily eroded Excessive permeability Limited organic matter content Part of surface removed Potential for ground-water pollution Surface compaction

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
EnC2:	
Casco	Easily eroded Excessive permeability Limited organic matter content Part of surface removed Potential for ground-water pollution
EpB2:	
Eldean	Excessive permeability Limited organic matter content Part of surface removed Potential for ground-water pollution Surface compaction
Miamian	Easily eroded Fair tilth Limited organic matter content Part of surface removed Surface compaction Surface crusting
EpC2:	
Eldean	Easily eroded Excessive permeability Limited organic matter content Part of surface removed Potential for ground-water pollution Surface compaction
Miamian	Easily eroded Limited organic matter content Part of surface removed Surface compaction Surface crusting
EpC3:	
Eldean	Easily eroded Excessive permeability Limited organic matter content Most of surface removed Poor tilth Potential for ground-water pollution Surface compaction
Miamian	Easily eroded Limited organic matter content Most of surface removed Poor tilth Surface compaction
EpD2:	
Eldean	Easily eroded Excessive permeability Limited organic matter content Part of surface removed Potential for ground-water pollution Slope Surface compaction

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
EpD2:	
Miamian	Easily eroded
	Limited organic matter content
	Part of surface removed
	Slope
	Surface compaction
	Surface crusting
Ge:	
Genesee	Excessive permeability
	Limited organic matter content
	Potential for ground-water pollution
	Rare flooding
	Surface compaction
	Surface crusting
Gn:	
Genesee	Excessive permeability
	Limited organic matter content
	Occasional flooding
	Potential for ground-water pollution
	Surface compaction
	Surface crusting
Ko:	
Kokomo	Fair tilth
	Frost heave
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
Lh:	
Linwood	Frost heave
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
Lm:	
Lippincott	Excessive permeability
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
Lp:	
Lippincott	Excessive permeability
	Fair tilth
	Limited available water capacity
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
MgB2:	
Miamian	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Potential for ground-water pollution
	Restricted permeability
	Surface compaction
	Surface crusting

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
MgC2:	
Miamian	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Potential for ground-water pollution
	Restricted permeability
	Surface compaction
	Surface crusting
MhA:	
Miamian	Limited organic matter content
	Surface compaction
	Surface crusting
MhB:	
Miamian	Easily eroded
	Limited organic matter content
	Surface compaction
	Surface crusting
MhB2:	
Miamian	Easily eroded
	Limited organic matter content
	Part of surface removed
	Surface compaction
	Surface crusting
MhC:	
Miamian	Easily eroded
	Limited organic matter content
	Surface compaction
	Surface crusting
MhC2:	
Miamian	Easily eroded
	Limited organic matter content
	Part of surface removed
	Surface compaction
	Surface crusting
MhD2:	
Miamian	Easily eroded
	Limited organic matter content
	Part of surface removed
	Slope
	Surface compaction
	Surface crusting
MkB2:	
Miamian	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Surface compaction
	Surface crusting
MkC2:	
Miamian	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Surface compaction
	Surface crusting

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
MkD2:	
Miamian	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Slope
	Surface compaction
	Surface crusting
MmC3:	
Miamian	Easily eroded
	Limited organic matter content
	Most of surface removed
	Poor tilth
	Surface compaction
Mo:	
Milford	Fair tilth
	Frost heave
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
Ms:	
Millsdale	Depth to rock
	Fair tilth
	Frost heave
	Limited available water capacity
	Ponding
	Potential for ground-water pollution
	Restricted permeability
	Seasonal high water table
	Surface compaction
MtA:	
Milton	Depth to rock
	Limited available water capacity
	Limited organic matter content
	Potential for ground-water pollution
	Surface compaction
	Surface crusting
MtB:	
Milton	Depth to rock
	Easily eroded
	Limited available water capacity
	Limited organic matter content
	Potential for ground-water pollution
	Surface compaction
	Surface crusting
MvC2:	
Milton	Depth to rock
	Easily eroded
	Fair tilth
	Limited available water capacity
	Limited organic matter content
	Part of surface removed
	Potential for ground-water pollution
	Surface compaction
	Surface crusting

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
OcA:	
Ockley	Excessive permeability
	Limited organic matter content
	Potential for ground-water pollution
	Surface compaction
	Surface crusting
OcB:	
Ockley	Excessive permeability
	Limited organic matter content
	Potential for ground-water pollution
	Surface compaction
	Surface crusting
Pa:	
Patton	Fair tilth
	Frost heave
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
RaA:	
Randolph	Depth to rock
	Frost heave
	Limited available water capacity
	Limited organic matter content
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
	Surface crusting
Rn:	
Ross	Occasional flooding
	Surface compaction
Ro:	
Ross	Fair tilth
	Rare flooding
	Surface compaction
RuA:	
Rush	Excessive permeability
	Frost heave
	Limited organic matter content
	Potential for ground-water pollution
	Surface compaction
	Surface crusting
ScA:	
Savona	Excessive permeability
	Frost heave
	Limited organic matter content
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
	Surface crusting

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
So:	
Sloan	Excessive permeability
	Frost heave
	Occasional flooding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
StB2:	
Strawn	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Surface compaction
	Surface crusting
StC2:	
Strawn	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Surface compaction
	Surface crusting
StD2:	
Strawn	Easily eroded
	Fair tilth
	Limited organic matter content
	Part of surface removed
	Slope
	Surface compaction
	Surface crusting
SuA:	
Strawn	Limited organic matter content
	Surface compaction
	Surface crusting
Crosby	Frost heave
	Limited organic matter content
	Restricted permeability
	Seasonal high water table
	Surface compaction
	Surface crusting
SuB:	
Strawn	Easily eroded
	Limited organic matter content
	Surface compaction
	Surface crusting
Crosby	Easily eroded
	Frost heave
	Limited organic matter content
	Restricted permeability
	Seasonal high water table
	Surface compaction
	Surface crusting

Table 3.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
ThA:	
Thackery	Excessive permeability
	Frost heave
	Limited organic matter content
	Potential for ground-water pollution
	Surface compaction
	Surface crusting
Tr:	
Tremont	Fair tilth
	Frost heave
	Potential for ground-water pollution
	Rare flooding
	Seasonal high water table
	Surface compaction
Ts:	
Tremont	Frost heave
	Occasional flooding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
Wc:	
Wallkill	Frost heave
	Occasional flooding
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
WeA:	
Warsaw	Excessive permeability
	Potential for ground-water pollution
	Surface compaction
WpA:	
Waupecan	Excessive permeability
	Frost heave
	Potential for ground-water pollution
	Surface compaction
WrA:	
Waynetown	Excessive permeability
	Frost heave
	Limited organic matter content
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction
	Surface crusting
Wt:	
Westland	Excessive permeability
	Fair tilth
	Frost heave
	Ponding
	Potential for ground-water pollution
	Seasonal high water table
	Surface compaction

Table 4.--Land Capability and Yields per Acre of Crops

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay
		Bu	Bu	Bu	Bu	Tons
Ad---Adrian	IVw	120	40	52	70	3.5
Ae---Adrian	Vw	---	---	---	---	---
Ca---Carlisle	IIIw	105	35	50	70	---
Cb---Carlisle	Vw	---	---	---	---	---
CcD2---Casco	VIe	65	---	---	45	3.5
CeA---Celina	I	120	40	52	70	6.5
CeB---Celina	IIe	115	40	50	70	6.5
ChA---Celina-Strawn	I	115	40	50	70	6.5
ChB---Celina-Strawn	IIe	110	40	48	70	6.5
CrA---Crosby	IIw	120	40	52	70	6.5
CrB---Crosby	IIe	115	40	50	70	6.5
DoE---Donnelsville	VIe	---	---	---	---	---
DpF: Donnelsville---Rock outcrop.	VIIe	---	---	---	---	---
Dr---Drummer	IIw	145	50	50	80	6.5
EmA---Eldean	IIs	115	40	50	70	5.0
EmB---Eldean	IIe	110	40	48	70	5.0
EmB2---Eldean	IIe	105	35	46	70	5.0
EmC2---Eldean	IIIe	85	30	38	60	4.5

Table 4.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay
		Bu	Bu	Bu	Bu	Tons
EnC2---------- Eldean-Casco	IIIe	80	25	36	60	4.0
EpB2---------- Eldean-Miamian	IIe	110	40	48	70	5.0
EpC2---------- Eldean-Miamian	IIIe	105	35	46	70	4.5
EpC3---------- Eldean-Miamian	IVe	80	25	36	60	4.0
EpD2---------- Eldean-Miamian	IVe	78	22	34	---	3.5
EpD3---------- Eldean-Miamian	VIe	54	16	21	---	3.0
EpE2---------- Eldean-Miamian	VIe	---	---	---	---	---
EsE3---------- Eldean-Rodman	VIe	---	---	---	---	---
EuB, EuC. Eldean-Urban land						
Ge---------- Genesee	IIw	125	45	52	70	5.5
Gn---------- Genesee	IIw	115	40	---	---	5.5
Ko---------- Kokomo	IIw	140	50	58	75	6.5
Lg---------- Linwood	Vw	---	---	---	---	---
Lh---------- Linwood	IIw	105	35	50	70	---
Lm, Lp---------- Lippincott	IIw	125	45	54	70	6.5
Lu. Lippincott-Urban land						
MgB2---------- Miamian	IIe	105	35	46	70	5.0
MgC2---------- Miamian	IIIe	85	30	38	60	4.5
MgE2---------- Miamian	VIe	---	---	---	---	---

Table 4.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay
		Bu	Bu	Bu	Bu	Tons
MhA---------- Miamian	I	125	45	54	70	6.0
MhB---------- Miamian	IIe	120	40	52	70	6.0
MhB2---------- Miamian	IIe	115	40	50	70	6.0
MhC---------- Miamian	IIIe	100	35	44	65	4.5
MhC2---------- Miamian	IIIe	95	30	42	65	4.5
MhD2---------- Miamian	IVe	---	---	---	---	4.0
MhE, MhE2-------- Miamian	VIe	---	---	---	---	---
MkB2---------- Miamian	IIe	110	40	48	70	6.0
MkC2---------- Miamian	IIIe	90	30	40	65	4.0
MkD2---------- Miamian	IVe	---	---	---	---	4.0
MmC3---------- Miamian	IVe	85	30	38	60	4.0
MmD3---------- Miamian	VIe	60	22	25	---	---
MmE3---------- Miamian	VIe	---	---	---	---	---
MnB, MnC. Miamian-Urban land						
Mo---------- Milford	IIIw	140	50	58	75	6.5
Ms---------- Millsdale	IIIw	120	40	52	70	5.5
MtA---------- Milton	IIs	110	40	48	70	5.0
MtB---------- Milton	IIe	105	35	46	70	5.0
MvC2---------- Milton	IIIe	75	25	34	60	4.5
MxB. Milton-Urban land						

Table 4.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay
		Bu	Bu	Bu	Bu	Tons
OcA---- Ockley	I	120	40	52	70	6.0
OcB---- Ockley	IIe	115	40	50	70	6.0
Pa---- Patton	IIw	135	45	58	70	6.5
Pg. Pits, gravel						
Ph. Pits, quarry						
RaA---- Randolph	IIIw	115	40	50	70	6.0
RgE---- Rodman	VIIs	---	---	---	---	---
Rn---- Ross	IIw	135	45	---	---	5.5
Ro---- Ross	I	150	50	60	80	6.5
RuA---- Rush	I	125	45	54	70	6.5
ScA---- Savona	IIw	120	40	52	70	6.5
So---- Sloan	IIIw	115	40	---	---	5.5
StB2---- Strawn	IIe	105	35	46	70	6.0
StC2---- Strawn	IIIe	85	30	38	60	4.5
StD2---- Strawn	IVe	---	---	---	---	3.5
StE2---- Strawn	VIe	---	---	---	---	---
SuA---- Strawn-Crosby	IIw	115	40	50	70	6.5
SuB---- Strawn-Crosby	IIe	110	40	48	70	6.5
ThA---- Thackery	I	115	40	50	70	6.5
Tr---- Tremont	I	150	50	60	80	6.5

Table 4.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay
		Bu	Bu	Bu	Bu	Tons
Ts Tremont	IIw	135	45	---	---	6.0
Ud. Udorthents						
Ur. Urban land						
Wc Wallkill	IIIw	100	35	---	---	3.5
WeA Warsaw	IIs	115	40	50	70	5.0
WpA Waupecan	I	155	60	60	80	7.0
WrA Waynetown	IIw	130	45	56	70	6.5
Wt Westland	IIw	145	50	58	80	6.5

Table 5.--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 problems (s)
		Acres	Acres	Acres
I	23,318	---	---	---
II	172,819	72,095	89,783	10,941
III	31,436	21,519	9,917	---
IV	11,269	10,466	803	---
V	922	---	922	---
VI	5,247	5,247	---	---
VII	2,210	280	---	1,930
VIII	---	---	---	---

Table 6.--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
CeA	Celina silt loam, 0 to 2 percent slopes
CeB	Celina silt loam, 2 to 6 percent slopes
ChA	Celina-Strawn complex, 0 to 2 percent slopes
ChB	Celina-Strawn complex, 2 to 6 percent slopes
CrA	Crosby silt loam, 0 to 2 percent slopes (where drained)
CrB	Crosby silt loam, 2 to 6 percent slopes (where drained)
Dr	Drummer silty clay loam, gravelly substratum (where drained)
EmA	Eldean silt loam, 0 to 2 percent slopes
EmB	Eldean silt loam, 2 to 6 percent slopes
EmB2	Eldean silt loam, 2 to 6 percent slopes, eroded
EpB2	Eldean-Miamian complex, 2 to 6 percent slopes, eroded
Ge	Genesee silt loam, till substratum, rarely flooded
Gn	Genesee silt loam, till substratum, occasionally flooded
Ko	Kokomo silty clay loam (where drained)
Lm	Lippincott mucky silt loam (where drained)
Lp	Lippincott silty clay loam (where drained)
MgB2	Miamian silty clay loam, limestone substratum, 2 to 6 percent slopes, eroded
MhA	Miamian silt loam, 0 to 2 percent slopes
MhB	Miamian silt loam, 2 to 6 percent slopes
MhB2	Miamian silt loam, 2 to 6 percent slopes, eroded
MkB2	Miamian silty clay loam, 2 to 6 percent slopes, eroded
Mo	Milford silty clay loam, sandy substratum (where drained)
Ms	Millsdale silty clay loam (where drained)
MtA	Milton silt loam, 0 to 2 percent slopes
MtB	Milton silt loam, 2 to 6 percent slopes
OcA	Ockley silt loam, 0 to 2 percent slopes
OcB	Ockley silt loam, 2 to 6 percent slopes
Pa	Patton silty clay loam (where drained)
RaA	Randolph silt loam, 0 to 2 percent slopes (where drained)
Rn	Ross silt loam, occasionally flooded
Ro	Ross silty clay loam, rarely flooded
RuA	Rush silt loam, 0 to 2 percent slopes
ScA	Savona silt loam, 0 to 2 percent slopes (where drained)
So	Sloan silt loam, sandy substratum, occasionally flooded (where drained)
StB2	Strawn silty clay loam, 2 to 6 percent slopes, eroded
SuA	Strawn-Crosby complex, 0 to 2 percent slopes (where drained)
SuB	Strawn-Crosby complex, 2 to 6 percent slopes (where drained)
ThA	Thackery silt loam, 0 to 2 percent slopes
Tr	Tremont silty clay loam, rarely flooded
Ts	Tremont silt loam, occasionally flooded
WeA	Warsaw silt loam, 0 to 3 percent slopes
WpA	Waupecan silt loam, 0 to 2 percent slopes
WrA	Waynetown silt loam, 0 to 2 percent slopes (where drained)
Wt	Westland silty clay loam (where drained)

Table 7.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ad:					
Adrian	Whitebelle honeysuckle, common ninebark.	Silky dogwood, Amur privet, Amur honeysuckle, nannyberry.	Tall purple willow	Golden willow, black willow.	Imperial Carolina poplar.
Ca:					
Carlisle	---	Silky dogwood, sargent crabapple, common ninebark, common lilac, southern arrowwood, nannyberry, American cranberrybush.	Black Hills spruce	Green ash, Norway spruce, eastern white pine.	Imperial Carolina poplar.
CcD2:					
Casco	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
CeA, CeB:					
Celina	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
ChA, ChB:					
Celina	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
Strawn	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

Table 7.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
CrA, CrB:					
Crosby	---	Washington hawthorn, eastern redcedar, Amur privet, Amur honeysuckle, southern arrowwood, American cranberrybush.	Green ash, Osage-orange, Austrian pine.	Eastern white pine, pin oak.	---
Dr:					
Drummer	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
EmA, EmB, EmB2, EmC2:					
Eldean	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
EnC2:					
Eldean	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
Casco	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
EpB2, EpC2, EpC3, EpD2, EpD3, EpE2:					
Eldean	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---

Table 7.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
EpB2, EpC2, EpC3, EpD2, EpD3, EpE2: Miamian	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
EsE3: Eldean	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
Rodman	Siberian peashrub	Silky dogwood, gray dogwood, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple.	Jack pine, Virginia pine, black locust.	---	---
EuB, EuC: Eldean	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
Urban land.					
Ge: Genesee	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
Gn: Genesee	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.

Table 7.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ko:					
Kokomo	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
Lg, Lh:					
Linwood	Whitebelle honeysuckle, common ninebark.	Silky dogwood, Amur privet, Amur honeysuckle, nannyberry.	Tall purple willow	Golden willow, black willow.	Imperial Carolina poplar.
Lm, Lp:					
Lippincott	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
Lu:					
Lippincott	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
Urban land.					
MgB2, MgC2, MgE2:					
Miamian	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
MhA, MhB, MhB2, MhC, MhC2, MhD2, MhE, MhE2:					
Miamian	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
MkB2, MkC2, MkD2:					
Miamian	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

Table 7.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
MmC3, MmD3, MmE3: Miamian	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
MnB, MnC: Miamian	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					
Mo: Milford	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
Ms: Millsdale	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	---
MtA, MtB: Milton	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
MvC2: Milton	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---

Table 7.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
MxB:					
Milton	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
Urban land.					
OcA, OcB:					
Ockley	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Pa:					
Patton	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
RaA:					
Randolph	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
RgE:					
Rodman	Siberian peashrub	Silky dogwood, gray dogwood, Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple.	Jack pine, Virginia pine, black locust.	---	---
Rn, Ro:					
Ross	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
RuA:					
Rush	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

Table 7.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
ScA: Savona	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
So: Sloan	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
StB2, StC2, StD2: Strawn	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
SuA, SuB: Strawn	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, blue spruce, northern whitecedar.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Crosby	---	Washington hawthorn, eastern redcedar, Amur privet, Amur honeysuckle, southern arrowwood, American cranberrybush.	Green ash, Osage-orange, Austrian pine.	Eastern white pine, pin oak.	---
ThA: Thackery	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
Tr, Ts: Tremont	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.

Table 7.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Wc:					
Wallkill	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.
WeA:					
Warsaw	Siberian peashrub	Washington hawthorn, autumn-olive, eastern redcedar, Amur honeysuckle, radiant crabapple, common lilac.	Jack pine, Austrian pine, red pine, eastern white pine.	---	---
WpA:					
Waupecan	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
WrA:					
Waynetown	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Austrian pine, blue spruce, northern whitecedar.	Norway spruce	Eastern white pine, pin oak.
Wt:					
Westland	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, Washington hawthorn, Norway spruce, Austrian pine, blue spruce, northern whitecedar.	Eastern white pine	Pin oak.

Table 8.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. See text for definitions of terms used in this table. Absence of an entry indicates that information was not available)

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
Ad:										
Adrian	4W	Slight	Severe	Severe	Severe	Severe	Quaking aspen	56	4	Red maple, silver maple, white ash, green ash, tamarack, eastern cottonwood, baldcypress, northern whitecedar.
							Black willow	---	---	
							Red maple	51	2	
							Silver maple	76	2	
							White ash	51	2	
Ae:										
Adrian	4W	Slight	Severe	Severe	Severe	Severe	Quaking aspen	56	4	Red maple, silver maple, white ash, green ash, tamarack, eastern cottonwood, baldcypress, northern whitecedar.
							Black willow	---	---	
							Red maple	51	2	
							Silver maple	76	2	
							White ash	51	2	
Ca, Cb:										
Carlisle	6W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	80	6	Red maple, green ash, black willow.
							White ash	---	---	
							Black cherry	---	---	
							Swamp white oak	---	---	
							Red maple	---	---	
							Green ash	---	---	
CcD2:										
Casco	4R	Moderate	Moderate	Moderate	Slight	Moderate	White oak	70	4	Red pine.
							Eastern white pine	85	14	
							Jack pine	68	7	
							Red pine	78	10	
CeA, CeB:										
Celina	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	90	5	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak, northern red oak.
							Black cherry	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	110	9	
							White oak	---	---	
							Sugar maple	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
ChA, ChB:										
Celina	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	90	5	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak, northern red oak.
							Black cherry	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	110	9	
							White oak	---	---	
							Sugar maple	---	---	
Strawn	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	4	Sugar maple, green ash, black walnut, red pine, eastern white pine, white oak, northern red oak.
							Black walnut	---	---	
							White oak	80	4	
							Tuliptree	90	6	
CrA, CrB:										
Crosby	5D	Slight	Moderate	Slight	Moderate	Severe	Northern red oak	86	5	Red maple, river birch, white ash, green ash, tuliptree, eastern white pine, American sycamore, white oak, northern red oak, black oak.
							Tuliptree	94	7	
							White ash	87	6	
							Black oak	88	5	
DoE:										
Donnelsville	2R	Severe	Severe	Slight	Slight	Moderate	Black oak	50	2	White ash, tuliptree, red pine, eastern white pine, Virginia pine, black oak.
							Black cherry	---	---	
							Scarlet oak	---	---	
							Tuliptree	---	---	
							Red maple	---	---	
DpF:										
Donnelsville	2R	Severe	Severe	Slight	Slight	Moderate	Black oak	50	2	White ash, tuliptree, red pine, eastern white pine, Virginia pine, black oak.
							Black cherry	---	---	
							Scarlet oak	---	---	
							Tuliptree	---	---	
							Red maple	---	---	
Rock outcrop.										

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
EmA, EmB, EmB2 EmC2:										
Eldean	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	4	White ash,
							Black cherry	---	---	black walnut,
							Sugar maple	---	---	white oak,
							Black oak	80	4	tuliptree, red
							White ash	---	---	pine, eastern
							Black walnut	---	---	white pine.
							Tuliptree	---	---	
							White oak	80	4	
EnC2:										
Eldean	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	4	White ash,
							Black cherry	---	---	black walnut,
							Sugar maple	---	---	white oak,
							Black oak	80	4	tuliptree, red
							White ash	---	---	pine, eastern
							Black walnut	---	---	white pine.
							Tuliptree	---	---	
							White oak	80	4	
Casco	4S	Slight	Moderate	Slight	Slight	Moderate	White oak	70	4	Red pine.
							Eastern white pine	85	14	
							Jack pine	68	7	
							Red pine	78	10	
EpB2, EpC2, EpC3:										
Eldean	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	4	White ash,
							Black cherry	---	---	black walnut,
							Sugar maple	---	---	white oak,
							Black oak	80	4	tuliptree, red
							White ash	---	---	pine, eastern
							Black walnut	---	---	white pine.
							Tuliptree	---	---	
							White oak	80	4	
Miamian	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	87	5	White ash,
							Black cherry	---	---	black walnut,
							White ash	---	---	tuliptree, red
							Black walnut	---	---	pine, eastern
							Tuliptree	---	---	white pine,
							White oak	---	---	white oak,
							Sugar maple	---	---	northern red
										oak.
EpD2, EpD3, EpE2:										
Eldean	4R	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	80	4	White ash,
							Black cherry	---	---	black walnut,
							Sugar maple	---	---	tuliptree, red
							Black oak	80	4	pine, eastern
							White ash	---	---	white pine,
							Black walnut	---	---	white oak.
							Tuliptree	---	---	
							White oak	80	4	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
EpD2, EpD3, EpE2:										
Miamian	5R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak	87	5	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak, northern red oak.
							Black cherry	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	---	---	
							White oak	---	---	
							Sugar maple	---	---	
EsE3:										
Eldean	4R	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	80	4	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak.
							Black cherry	---	---	
							Sugar maple	---	---	
							Black oak	80	4	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	---	---	
							White oak	80	4	
Rodman	4R	Moderate	Moderate	Severe	Slight	Slight	White oak	70	4	Red pine, eastern white pine.
							Northern red oak	70	4	
							Red pine	75	10	
							Eastern white pine	85	14	
Ge, Gn:										
Genesee	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	90	5	Black walnut, tuliptree, eastern white pine.
							Tuliptree	100	8	
Ko:										
Kokomo	4W	Slight	Severe	Severe	Severe	Severe	Northern red oak	75	4	Red maple, river birch, green ash, Norway spruce, American sycamore, eastern cottonwood, swamp white oak, bur oak, pin oak.
							White oak	75	4	
							Sweetgum	90	7	
							Pin oak	85	5	
Lg, Lh:										
Linwood	2W	Slight	Severe	Severe	Severe	Severe	Red maple	46	2	Red maple, green ash, sweetgum, American sycamore, eastern cottonwood, swamp white oak, pin oak, baldcypress.
							Green ash	---	---	
							American sycamore	---	---	
							Eastern cottonwood	---	---	
							Pin oak	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
Lm, Lp:										
Lippincott	4W	Slight	Severe	Severe	Severe	Severe	Northern red oak	80	4	Red maple, silver maple, green ash, sweetgum, American sycamore, eastern cottonwood, swamp white oak, pin oak, baldcypress.
							Black cherry	---	---	
							Black oak	80	4	
							Red maple	---	---	
							Green ash	---	---	
							Eastern cottonwood	---	---	
							Swamp white oak	85	5	
							Pin oak	88	5	
MgB2, MgC2, MgE2:										
Miamian	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	87	5	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak, northern red oak.
							Black cherry	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	---	---	
							White oak	---	---	
							Sugar maple	---	---	
MhA, MhB, MhB2, MhC, MhC2:										
Miamian	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	87	5	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak, northern red oak.
							Black cherry	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	---	---	
							White oak	---	---	
							Sugar maple	---	---	
MhD2, MhE, MhE2:										
Miamian	5R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak	87	5	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak, northern red oak.
							Black cherry	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	---	---	
							White oak	---	---	
							Sugar maple	---	---	
MkB2, MkC2:										
Miamian	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	87	5	White ash, black walnut, tuliptree, red pine, eastern white pine, white oak, northern red oak.
							Black cherry	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Tuliptree	---	---	
							White oak	---	---	
							Sugar maple	---	---	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
MkD2:										
Miamian	5R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak	87	5	White ash,
							Black cherry	---	---	black walnut,
							White ash	---	---	tuliptree, red
							Black walnut	---	---	pine, eastern
							Tuliptree	---	---	white pine,
							White oak	---	---	white oak,
							Sugar maple	---	---	northern red
										oak.
MmC3:										
Miamian	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	87	5	White ash,
							Black cherry	---	---	black walnut,
							White ash	---	---	tuliptree, red
							Black walnut	---	---	pine, eastern
							Tuliptree	---	---	white pine,
							White oak	---	---	white oak,
							Sugar maple	---	---	northern red
										oak.
MmD3, MmE3:										
Miamian	5R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak	87	5	White ash,
							Black cherry	---	---	black walnut,
							White ash	---	---	tuliptree, red
							Black walnut	---	---	pine, eastern
							Tuliptree	---	---	white pine,
							White oak	---	---	white oak,
							Sugar maple	---	---	northern red
										oak.
Ms:										
Millsdale	5W	Slight	Severe	Severe	Severe	Severe	Pin oak	86	5	Red maple,
							Red maple	---	---	green ash,
							Green ash	---	---	sweetgum,
							Eastern cottonwood	---	---	American
							Swamp white oak	---	---	sycamore,
							Black cherry	---	---	eastern
										cottonwood,
										swamp white
										oak, pin oak,
										baldcypress.
MtA, MtB:										
Milton	4D	Slight	Slight	Slight	Moderate	Moderate	Northern red oak	80	4	White ash,
							Black cherry	---	---	black walnut,
							White ash	---	---	tuliptree, red
							Black walnut	---	---	pine, eastern
							Tuliptree	95	7	white pine,
							White oak	---	---	white oak,
							Sugar maple	---	---	northern red
										oak.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
MvC2:										
Milton	4D	Slight	Slight	Slight	Moderate	Moderate	Northern red oak	80	4	White ash,
							Black cherry	---	---	black walnut,
							White ash	---	---	tuliptree, red
							Black walnut	---	---	pine, eastern
							Tuliptree	95	7	white pine,
							White oak	---	---	white oak,
							Sugar maple	---	---	northern red
										oak.
OcA, OcB:										
Ockley	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	90	5	White ash,
							White ash	---	---	black walnut,
							Tuliptree	100	8	tuliptree, red
							White oak	90	5	pine, eastern
							Sweetgum	76	5	white pine,
										white oak,
										northern red
										oak, black
										oak, black
										locust.
Pa:										
Patton	4W	Slight	Severe	Moderate	Moderate	Severe	Northern red oak	75	4	Red maple,
							White oak	75	4	white ash,
							Sweetgum	80	6	sweetgum,
							Pin oak	85	5	Norway spruce,
										eastern white
										pine, pin oak,
										baldcypress.
RaA:										
Randolph	4A	Slight	Slight	Slight	Slight	Severe	Northern red oak	75	4	Tuliptree,
							Sugar maple	90	4	eastern white
							Tuliptree	85	6	pine.
RgE:										
Rodman	4R	Moderate	Moderate	Severe	Slight	Slight	Northern red oak	75	4	Jack pine, red
							White oak	75	4	pine, eastern
							Red pine	75	10	white pine.
							Eastern white pine	85	14	
Rn, Ro:										
Ross	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	86	5	White ash,
							Black cherry	---	---	black walnut,
							White oak	---	---	tuliptree,
							Sugar maple	85	4	Norway spruce,
							White ash	---	---	eastern white
							Black walnut	---	---	pine.
							Tuliptree	96	7	

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
RuA:										
Rush	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	90	5	White ash,
							White oak	90	5	black walnut,
							Sweetgum	---	---	tuliptree, red
							Tuliptree	98	7	pine, eastern
										white pine,
										black locust.
ScA:										
Savona	4A	Slight	Slight	Slight	Slight	Severe	Pin oak	80	4	White ash,
							Sugar maple	---	---	green ash,
							White ash	---	---	tuliptree, red
							Tuliptree	---	---	pine, eastern
							Black cherry	---	---	white pine,
							White oak	---	---	American
							Northern red oak	---	---	sycamore,
										black cherry,
										white oak,
										northern red
										oak, black
										locust.
So:										
Sloan	5W	Slight	Severe	Moderate	Moderate	Severe	Pin oak	86	5	Red maple,
							Green ash	---	---	silver maple,
							Eastern cottonwood	---	---	green ash,
							Swamp white oak	---	---	sweetgum,
							Red maple	---	---	American
										sycamore,
										eastern
										cottonwood,
										swamp white
										oak, pin oak.
StB2, StC2:										
Strawn	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	4	Sugar maple,
							Black walnut	---	---	green ash,
							White oak	80	4	black walnut,
							Tuliptree	90	6	red pine,
										eastern white
										pine, white
										oak, northern
										red oak.
StD2, StE2:										
Strawn	4R	Moderate	Moderate	Moderate	Slight	Moderate	Northern red oak	80	4	Sugar maple,
							Black walnut	---	---	green ash,
							White oak	80	4	black walnut,
							Tuliptree	90	6	red pine,
										eastern white
										pine, white
										oak, northern
										red oak.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
SuA, SuB:										
Strawn	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	4	Sugar maple,
							Black walnut	---	---	green ash,
							White oak	80	4	black walnut,
							Tuliptree	90	6	red pine, eastern white pine, white oak, northern red oak.
Crosby	5D	Slight	Moderate	Slight	Moderate	Severe	Northern red oak	86	5	Red maple,
							Tuliptree	94	7	river birch,
							White ash	87	6	white ash,
							Black oak	88	5	green ash, tuliptree, eastern white pine, American sycamore, white oak, northern red oak, black oak.
ThA:										
Thackery	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	90	5	White ash,
							White ash	---	---	green ash,
							Black walnut	---	---	black walnut,
							Tuliptree	---	---	tuliptree, red pine, eastern
							Black cherry	---	---	white pine,
							White oak	90	5	black cherry,
							Sugar maple	---	---	white oak, northern red oak, black locust.
Tr, Ts:										
Tremont	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	86	5	White ash,
							Black cherry	---	---	black walnut,
							White ash	---	---	tuliptree, red
							Black walnut	---	---	pine, eastern
							Tuliptree	96	7	white pine,
							White oak	---	---	white oak,
							Sugar maple	---	---	northern red oak.
Wc:										
Wallkill	2W	Slight	Severe	Severe	Severe	Severe	Silver maple	70	2	---
							Black willow	---	---	
WrA:										
Waynetown	5A	Slight	Slight	Slight	Slight	Moderate	Pin oak	85	5	Red maple,
							White oak	75	4	white ash,
							Sweetgum	80	6	tuliptree,
							Tuliptree	85	6	eastern white pine, American sycamore.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
Wt:										
Westland	5W	Slight	Severe	Severe	Severe	Severe	Pin oak	85	5	Red maple, white ash, green ash, sweetgum, American sycamore, eastern cottonwood, swamp white oak, bur oak, pin oak, baldcypress.
							Sweetgum	90	7	
							White oak	75	4	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 9.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of entry indicates that no rating is applicable)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ad, Ae:					
Adrian	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Ca, Cb:					
Carlisle	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
CcD2:					
Casco	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
CeA:					
Celina	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
CeB:					
Celina	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
ChA:					
Celina	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
Strawn	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
ChB:					
Celina	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
Strawn	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
CrA, CrB:					
Crosby	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
DoE:					
Donnelsville	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DpF:					
Donnelsville	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Rock outcrop.					
Dr:					
Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
EmA:					
Eldean	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: small stones, percs slowly.	Severe: erodes easily.	Moderate: droughty.
EmB, EmB2:					
Eldean	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: erodes easily.	Moderate: droughty.
EmC2:					
Eldean	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: droughty, slope.
EnC2:					
Eldean	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: droughty, slope.
Casco	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Severe: droughty.
EpB2:					
Eldean	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Moderate: droughty.
Miamian	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight	Slight.
EpC2, EpC3:					
Eldean	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: droughty, slope.
Miamian	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
EpD2, EpD3:					
Eldean	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EpE2:					
Eldean	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
EsE3:					
Eldean	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Rodman	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
EuB:					
Eldean	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: erodes easily.	Moderate: droughty.
Urban land.					
EuC:					
Eldean	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: droughty, slope.
Urban land.					
Ge, Gn:					
Genesee	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Ko:					
Kokomo	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Lg:					
Linwood	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Lh:					
Linwood	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Lm, Lp:					
Lippincott	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Lu:					
Lippincott	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Urban land.					
MgB2:					
Miamian	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MgC2, MgE2:					
Miamian	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MhA:					
Miamian	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
MhB, MhB2:					
Miamian	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
MhC, MhC2:					
Miamian	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MhD2, MhE, MhE2:					
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
MkB2:					
Miamian	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight	Slight.
MkC2:					
Miamian	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MkD2:					
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
MmC3:					
Miamian	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MmD3, MmE3:					
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
MnB:					
Miamian	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
Urban land.					
MnC:					
Miamian	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Urban land.					
Mo:					
Milford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ms:					
Millsdale	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
MtA:					
Milton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Moderate: thin layer, area reclaim.
MtB:					
Milton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, thin layer, area reclaim.	Slight	Moderate: thin layer, area reclaim.
MvC2:					
Milton	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, thin layer, area reclaim.
MxB:					
Milton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, thin layer, area reclaim.	Slight	Moderate: thin layer, area reclaim.
Urban land.					
OcA:					
Ockley	Slight	Slight	Moderate: small stones.	Slight	Slight.
OcB:					
Ockley	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Pa:					
Patton	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Pg:					
Pits, gravel.					
Ph:					
Pits, quarry.					
RaA:					
Randolph	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, thin layer, area reclaim.
RgE:					
Rodman	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
Rn:					
Ross	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ro:					
Ross	Severe: flooding.	Slight	Slight	Slight	Slight.
RuA:					
Rush	Slight	Slight	Slight	Slight	Slight.
ScA:					
Savona	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
So:					
Sloan	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
StB2:					
Strawn	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
StC2:					
Strawn	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
StD2, StE2:					
Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
SuA, SuB:					
Strawn	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
Crosby	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
ThA:					
Thackery	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
Tr:					
Tremont	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Ts:					
Tremont	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
Ud:					
Udorthents	Slight	Slight	Slight	Slight	Slight.
Ur:					
Urban land.					

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Wc:					
Wallkill	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, flooding.
WeA:					
Warsaw	Slight	Slight	Moderate: small stones.	Slight	Slight.
WpA:					
Waupecan	Slight	Slight	Slight	Slight	Slight.
WrA:					
Waynetown	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Wt:					
Westland	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 10.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements							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, Ae:										
Adrian	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ca, Cb:										
Carlisle	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
CcD2:										
Casco	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CeA:										
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CeB:										
Celina	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ChA:										
Celina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Strawn	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ChB:										
Celina	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Strawn	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CrA:										
Crosby	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
CrB:										
Crosby	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DoE:										
Donnelsville	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Fair.
DpF:										
Donnelsville	Very poor.	Poor	Good	Fair	Fair	Poor	Very poor.	Poor	Fair	Fair.
Rock outcrop.										
Dr:										
Drummer	Fair	Fair	Good	Fair	Fair	Good	Good	Fair	Fair	Good.
EmA, EmB, EmB2:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EmC2:										
Eldean	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	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
EnC2:										
Eldean	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Casco	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EpB2:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EpC2, EpC3:										
Eldean	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Miamian	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EpD2, EpD3, EpE2:										
Eldean	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EsE3:										
Eldean	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
EuB:										
Eldean	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
EuC:										
Eldean	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
Ge, Gn:										
Genesee	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Ko:										
Kokomo	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Lg, Lh:										
Linwood	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Lm, Lp:										
Lippincott	Poor	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	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
Lu:										
Lippincott	Poor	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Urban land.										
MgB2:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MgC2, MgE2:										
Miamian	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MhA:										
Miamian	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MhB, MhB2:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MhC, MhC2:										
Miamian	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MhD2, MhE, MhE2:										
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MkB2:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MkC2:										
Miamian	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MkD2:										
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MmC3:										
Miamian	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MmD3, MmE3:										
Miamian	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MnB:										
Miamian	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
MnC:										
Miamian	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	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
Mo:										
Milford	Good	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ms:										
Millsdale	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	Fair.
MtA, MtB:										
Milton	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
MvC2:										
Milton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MxB:										
Milton	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Urban land.										
OcA, OcB:										
Ockley	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pa:										
Patton	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
Pg:										
Pits, gravel.										
Ph:										
Pits, quarry.										
RaA:										
Randolph	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
RgE:										
Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rn, Ro:										
Ross	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RuA:										
Rush	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ScA:										
Savona	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
So:										
Sloan	Fair	Fair	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
StB2, StC2:										
Strawn	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
StD2:										
Strawn	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	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
StE2:										
Strawn	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SuA:										
Strawn	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Crosby	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
SuB:										
Strawn	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Crosby	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ThA:										
Thackery	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Tr, Ts:										
Tremont	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ud:										
Udorthents	Poor	Poor	Fair	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
Ur:										
Urban land.										
Wc:										
Wallkill	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
WeA:										
Warsaw	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WpA:										
Waupecan	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WrA:										
Waynetown	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Wt:										
Westland	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.

Table 11.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ad, Ae:						
Adrian	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
Ca, Cb:						
Carlisle	Severe: excess humus, ponding.	Severe: ponding, low strength, subsides.	Severe: ponding, low strength, subsides.	Severe: ponding, low strength, subsides.	Severe: ponding, frost action, subsides.	Severe: ponding, excess humus.
CcD2:						
Casco	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
CeA:						
Celina	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
CeB:						
Celina	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Slight.
ChA:						
Celina	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
Strawn	Slight	Slight	Slight	Slight	Moderate: low strength, frost action.	Slight.
ChB:						
Celina	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Strawn	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
CrA, CrB:						
Crosby	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
DoE:						
Donnelsville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
DpF:						
Donnelsville	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: small stones, slope.
Rock outcrop.						
Dr:						
Drummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
EmA:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.	Moderate: droughty.
EmB, EmB2:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: droughty.
EmC2:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: droughty, slope.
EnC2:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: droughty, slope.
Casco	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
EpB2:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: droughty.
Miamian	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
EpC2, EpC3:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: droughty, slope.
Miamian	Moderate: too clayey, dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
EpD2, EpD3, EpE2:						
Eldean	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EsE3:						
Eldean	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rodman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
EuB:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: droughty.
Urban land.						
EuC:						
Eldean	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: droughty, slope.
Urban land.						
Ge, Gn:						
Genesee	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Ko:						
Kokomo	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Lg:						
Linwood	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
Lh:						
Linwood	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding.
Lm, Lp:						
Lippincott	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
Lu:						
Lippincott	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
Urban land.						
MgB2:						
Miamian	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MgC2, MgE2:						
Miamian	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
MhA:						
Miamian	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.	Slight.
MhB, MhB2:						
Miamian	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
MhC, MhC2:						
Miamian	Moderate: too clayey, dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
MhD2, MhE, MhE2:						
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MkB2:						
Miamian	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
MkC2:						
Miamian	Moderate: too clayey, dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
MkD2:						
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MmC3:						
Miamian	Moderate: too clayey, dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
MmD3, MmE3:						
Miamian	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MnB:						
Miamian	Moderate: too clayey, dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Urban land.						

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MnC:						
Miamian	Moderate: too clayey, dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Urban land.						
Mo:						
Milford	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Ms:						
Millsdale	Severe: depth to rock, ponding.	Severe: ponding, shrink-swell.	Severe: ponding, depth to rock, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
MtA:						
Milton	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Moderate: thin layer, area reclaim.
MtB:						
Milton	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: low strength.	Moderate: thin layer, area reclaim.
MvC2:						
Milton	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer, area reclaim.
MxB:						
Milton	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: low strength.	Moderate: thin layer, area reclaim.
Urban land.						
OcA:						
Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
OcB:						
Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Pa:						
Patton	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Pg:						
Pits, gravel.						

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ph: Pits, quarry.						
RaA: Randolph	Severe: depth to rock, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness, thin layer, area reclaim.
RgE: Rodman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Rn: Ross	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Ro: Ross	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: low strength, flooding, frost action.	Slight.
RuA: Rush	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
ScA: Savona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
So: Sloan	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
StB2: Strawn	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
StC2: Strawn	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
StD2, StE2: Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SuA: Strawn	Slight	Slight	Slight	Slight	Moderate: low strength, frost action.	Slight.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SuA:						
Crosby	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
SuB:						
Strawn	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
Crosby	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
ThA:						
Thackery	Severe: cutbanks cave, wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.	Slight.
Tr:						
Tremont	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, frost action.	Moderate: wetness.
Ts:						
Tremont	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
Ud:						
Udorthents	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.
Ur:						
Urban land.						
Wc:						
Wallkill	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: wetness, flooding, frost action.	Severe: wetness, flooding.
WeA:						
Warsaw	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
WpA:						
Waupecan	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
WrA:						
Waynetown	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Wt: Westland	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.

Table 12.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ad, Ae:					
Adrian	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Ca, Cb:					
Carlisle	Severe: ponding, percs slowly, subsides.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
CcD2:					
Casco	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
CeA, CeB:					
Celina	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
ChA, ChB:					
Celina	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
Strawn	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
CrA:					
Crosby	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
CrB:					
Crosby	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
DoE:					
Donnelsville	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
DpF:					
Donnelsville	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Rock outcrop.					

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Dr:					
Drummer	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: ponding.
EmA, EmB, EmB2:					
Eldean	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
EmC2:					
Eldean	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
EnC2:					
Eldean	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Casco	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
EpB2:					
Eldean	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Miamian	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
EpC2, EpC3:					
Eldean	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Miamian	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
EpD2, EpD3, EpE2:					
Eldean	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Miamian	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EsE3:					
Eldean	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Rodman	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
EuB:					
Eldean	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Urban land.					
EuC:					
Eldean	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Urban land.					
Ge, Gn:					
Genesee	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness, thin layer.
Ko:					
Kokomo	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
Lg, Lh:					
Linwood	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: ponding.
Lm:					
Lippincott	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
Lp:					
Lippincott	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: small stones, ponding, too clayey.
Lu:					
Lippincott	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: small stones, ponding, too clayey.
Urban land.					

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MgB2:					
Miamian	Severe: percs slowly.	Moderate: depth to rock, seepage, slope.	Severe: depth to rock, seepage.	Slight	Poor: too clayey.
MgC2, MgE2:					
Miamian	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, seepage.	Moderate: slope.	Poor: too clayey.
MhA:					
Miamian	Severe: percs slowly.	Slight	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
MhB, MhB2:					
Miamian	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
MhC, MhC2:					
Miamian	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
MhD2, MhE, MhE2:					
Miamian	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MkB2:					
Miamian	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
MkC2:					
Miamian	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
MkD2:					
Miamian	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MmC3:					
Miamian	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
MmD3, MmE3:					
Miamian	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MnB:					
Miamian	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
Urban land.					
MnC:					
Miamian	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
Urban land.					
Mo:					
Milford	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Ms:					
Millsdale	Severe: depth to rock, ponding, percs slowly.	Severe: depth to rock, ponding.	Severe: depth to rock, ponding, too clayey.	Severe: depth to rock, ponding.	Poor: depth to rock, too clayey, hard to pack.
MtA, MtB:					
Milton	Severe: thin layer, seepage, percs slowly.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Moderate: seepage.	Poor: area reclaim, too clayey.
MvC2:					
Milton	Severe: thin layer, seepage, percs slowly.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage.	Moderate: seepage, slope.	Poor: area reclaim, too clayey.
MxB:					
Milton	Severe: thin layer, seepage, percs slowly.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Moderate: seepage.	Poor: area reclaim, too clayey.
Urban land.					
OcA, OcB:					
Ockley	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
Pa:					
Patton	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
Pg:					
Pits, gravel.					
Ph:					
Pits, quarry.					

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
RaA:					
Randolph	Severe: thin layer, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: wetness.	Poor: area reclaim, too clayey, hard to pack.
RgE:					
Rodman	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Rn:					
Ross	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Good.
Ro:					
Ross	Moderate: flooding, wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Good.
RuA:					
Rush	Slight	Moderate: seepage.	Severe: seepage.	Slight	Fair: too clayey.
ScA:					
Savona	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, wetness, hard to pack.
So:					
Sloan	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
StB2:					
Strawn	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
StC2:					
Strawn	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
StD2, StE2:					
Strawn	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
SuA:					
Strawn	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
Crosby	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SuB:					
Strawn	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
Crosby	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
ThA:					
Thackery	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, small stones, wetness.
Tr:					
Tremont	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness, thin layer.
Ts:					
Tremont	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness, thin layer.
Ud:					
Udorthents	Slight	Slight	Slight	Slight	Poor: thin layer.
Ur:					
Urban land.					
Wc:					
Wallkill	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, excess humus.
WeA:					
Warsaw	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
WpA:					
Waupecan	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey, thin layer.
WrA:					
Waynetown	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Wt: Westland	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: small stones, ponding.

Table 13.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Ad, Ae:				
Adrian	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
Ca, Cb:				
Carlisle	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
CcD2:				
Casco	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
CeA, CeB:				
Celina	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
ChA, ChB:				
Celina	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Strawn	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CrA, CrB:				
Crosby	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
DoE:				
Donnelsville	Fair: depth to rock, large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
DpF:				
Donnelsville	Poor: large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
Rock outcrop.				
Dr:				
Drummer	Poor: wetness.	Probable	Probable	Poor: wetness.
EmA, EmB, EmB2, EmC2:				
Eldean	Good	Probable	Probable	Poor: small stones, area reclaim.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
EnC2:				
Eldean	Good	Probable	Probable	Poor: small stones, area reclaim.
Casco	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
EpB2, EpC2, EpC3:				
Eldean	Good	Probable	Probable	Poor: small stones, area reclaim.
Miamian	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
EpD2, EpD3, EpE2:				
Eldean	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
Miamian	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
EsE3:				
Eldean	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
Rodman	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
EuB, EuC:				
Eldean	Good	Probable	Probable	Poor: small stones, area reclaim.
Urban land.				
Ge, Gn:				
Genesee	Good	Probable	Probable	Good.
Ko:				
Kokomo	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Lg, Lh:				
Linwood	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Lm:				
Lippincott	Poor: wetness.	Probable	Probable	Poor: too clayey, small stones, area reclaim.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Lp:				
Lippincott	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
Lu:				
Lippincott	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
Urban land.				
MgB2, MgC2, MgE2:				
Miamian	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MhA, MhB, MhB2, MhC, MhC2:				
Miamian	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MhD2, MhE, MhE2:				
Miamian	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MkB2, MkC2:				
Miamian	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MkD2:				
Miamian	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MmC3:				
Miamian	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MmD3, MmE3:				
Miamian	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MnB, MnC:				
Miamian	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
Mo:				
Milford	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ms:				
Millsdale	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
MtA, MtB, MvC2:				
Milton	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
MxB:				
Milton	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
OcA, OcB:				
Ockley	Good	Probable	Probable	Poor: small stones, area reclaim.
Pa:				
Patton	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pg:				
Pits, gravel.				
Ph:				
Pits, quarry.				
RaA:				
Randolph	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
RgE:				
Rodman	Poor: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Rn, Ro:				
Ross	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
RuA:				
Rush	Good	Probable	Probable	Poor: area reclaim.
ScA:				
Savona	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
So:				
Sloan	Poor: wetness.	Probable	Probable	Poor: area reclaim, wetness.
StB2, StC2:				
Strawn	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
StD2, StE2:				
Strawn	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
SuA, SuB:				
Strawn	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Crosby	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
ThA:				
Thackery	Fair: wetness.	Probable	Probable	Poor: area reclaim.
Tr, Ts:				
Tremont	Fair: wetness.	Probable	Probable	Fair: small stones, area reclaim.
Ud:				
Udorthents	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Ur:				
Urban land.				
Wc:				
Wallkill	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
WeA:				
Warsaw	Good	Probable	Probable	Poor: small stones, area reclaim.
WpA:				
Waupecan	Good	Probable	Probable	Poor: area reclaim.
WrA:				
Waynetown	Poor: wetness.	Probable	Probable	Poor: wetness.
Wt:				
Westland	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.

Table 14.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ad, Ae:							
Adrian	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing, rooting depth.	Ponding, too sandy, soil blowing.	Wetness, rooting depth.
Ca, Cb:							
Carlisle	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
CcD2:							
Casco	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, large stones, too sandy.	Large stones, slope, droughty.
CeA:							
Celina	Slight	Severe: piping.	Severe: no water.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, rooting depth.
CeB:							
Celina	Moderate: slope.	Severe: piping.	Severe: no water.	Frost action, slope.	Wetness, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
ChA:							
Celina	Slight	Severe: piping.	Severe: no water.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, rooting depth.
Strawn	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
ChB:							
Celina	Moderate: slope.	Severe: piping.	Severe: no water.	Frost action, slope.	Wetness, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
Strawn	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
CrA:							
Crosby	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness	Erodes easily, wetness.	Wetness, erodes easily.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
CrB:							
Crosby	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Wetness, erodes easily.
DoE:							
Donnelsville	Severe: seepage, slope.	Severe: seepage, piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
DpF:							
Donnelsville	Severe: seepage, slope.	Severe: seepage, piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Rock outcrop.							
Dr:							
Drummer	Moderate: seepage.	Severe: ponding.	Moderate: slow refill, cutbanks cave.	Ponding, frost action.	Ponding	Ponding	Wetness.
EmA:							
Eldean	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, erodes easily.	Erodes easily, too sandy.	Erodes easily, droughty.
EmB, EmB2:							
Eldean	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, erodes easily.	Erodes easily, too sandy.	Erodes easily, droughty.
EmC2:							
Eldean	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
EnC2:							
Eldean	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
Casco	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, large stones, too sandy.	Large stones, slope, droughty.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
EpB2:							
Eldean	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Erodes easily, too sandy.	Erodes easily, droughty.
Miamian	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.
EpC2, EpC3, EpD2, EpD3:							
Eldean	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
Miamian	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
EpE2:							
Eldean	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
Miamian	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
EsE3:							
Eldean	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
Rodman	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
EuB:							
Eldean	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, erodes easily.	Erodes easily, too sandy.	Erodes easily, droughty.
Urban land.							

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
EuC:							
Eldean	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
Urban land.							
Ge, Gn:							
Genesee	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill, cutbanks cave.	Deep to water	Flooding	Favorable	Favorable.
Ko:							
Kokomo	Slight	Severe: ponding.	Severe: slow refill.	Ponding, frost action.	Ponding, percs slowly.	Ponding	Wetness.
Lg:							
Linwood	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing, rooting depth.	Large stones, ponding.	Large stones, wetness, rooting depth.
Lh:							
Linwood	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, rooting depth.	Ponding	Wetness, rooting depth.
Lm:							
Lippincott	Severe: seepage.	Severe: hard to pack, ponding.	Severe: cutbanks cave.	Ponding	Ponding, rooting depth.	Ponding	Wetness, rooting depth.
Lp:							
Lippincott	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding	Ponding	Wetness.
Lu:							
Lippincott	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding	Ponding	Wetness.
Urban land.							

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
MgB2:							
Miamian	Moderate: depth to rock, seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.
MgC2, MgE2:							
Miamian	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
MhA:							
Miamian	Slight	Severe: piping.	Severe: no water.	Deep to water	Rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.
MhB, MhB2:							
Miamian	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.
MhC, MhC2, MhD2, MhE, MhE2:							
Miamian	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
MkB2:							
Miamian	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.
MkC2, MkD2, MmC3, MmD3, MmE3:							
Miamian	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
MnB:							
Miamian	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.
Urban land.							

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
MnC:							
Miamian	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
Urban land.							
Mo:							
Milford	Moderate: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, frost action.	Ponding	Ponding	Wetness.
Ms:							
Millsdale	Moderate: depth to rock.	Severe: ponding.	Severe: no water.	Ponding, depth to rock, frost action.	Ponding, depth to rock.	Depth to rock, ponding.	Wetness, depth to rock.
MtA:							
Milton	Moderate: seepage, depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Thin layer, erodes easily.	Depth to rock, area reclaim.	Erodes easily, depth to rock.
MtB:							
Milton	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, thin layer, erodes easily.	Depth to rock, area reclaim.	Erodes easily, depth to rock.
MvC2:							
Milton	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, thin layer, erodes easily.	Slope, depth to rock, area reclaim.	Slope, erodes easily, depth to rock.
MxB:							
Milton	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, thin layer, erodes easily.	Depth to rock, area reclaim.	Erodes easily, depth to rock.
Urban land.							
OcA:							
Ockley	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
OcB: Ockley	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Pa: Patton	Moderate: seepage.	Severe: hard to pack, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Erodes easily, ponding.	Wetness, erodes easily.
Pg: Pits, gravel.							
Ph: Pits, quarry.							
RaA: Randolph	Moderate: depth to rock, seepage.	Severe: thin layer.	Severe: no water.	Thin layer, frost action.	Wetness, thin layer.	Depth to rock, area reclaim, erodes easily.	Wetness, erodes easily, depth to rock.
RgE: Rodman	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy.	Slope, droughty.
Rn: Ross	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Flooding	Favorable	Favorable.
Ro: Ross	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable	Favorable	Favorable.
RuA: Rush	Moderate: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
ScA: Savona	Severe: seepage.	Severe: wetness, thin layer.	Severe: slow refill, cutbanks cave.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
So:							
Sloan	Severe: seepage.	Severe: thin layer, wetness.	Severe: slow refill, cutbanks cave.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
StB2:							
Strawn	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
StC2, StD2, StE2:							
Strawn	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
SuA:							
Strawn	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Crosby	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
SuB:							
Strawn	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Crosby	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Wetness, erodes easily.
ThA:							
Thackery	Severe: seepage.	Moderate: thin layer, piping, wetness.	Severe: cutbanks cave.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Tr:							
Tremont	Severe: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action	Wetness	Wetness	Favorable.
Ts:							
Tremont	Severe: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness, flooding.	Wetness	Favorable.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ud:							
Udorthents	Slight	Slight	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.
Ur:							
Urban land.							
Wc:							
Wallkill	Severe: seepage.	Severe: excess humus, wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
WeA:							
Warsaw	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable	Too sandy	Favorable.
WpA:							
Waupecan	Severe: seepage.	Moderate: thin layer.	Severe: no water.	Deep to water	Rooting depth	Erodes easily	Erodes easily, rooting depth.
WrA:							
Waynetown	Moderate: seepage.	Severe: wetness.	Severe: cutbanks cave.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Wt:							
Westland	Severe: seepage.	Severe: piping, ponding.	Severe: cutbanks cave.	Ponding, frost action.	Ponding	Ponding	Wetness.

Table 15.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ad:												
Adrian	0-22	Muck	PT	A-8	0	0	0	0	0	0	---	NP
	22-80	Very gravelly sandy loam, very gravelly loamy sand.	SP, SM	A-2, A-3, A-1	0	0	80-100	55-100	35-75	0-30	0-14	NP
Ae:												
Adrian	0-36	Muck	PT	A-8	0	0	0	0	0	0	---	NP
	36-80	Very gravelly sandy loam, very gravelly loamy sand.	SP, SM	A-2, A-3, A-1	0	0	80-100	55-100	35-75	0-30	0-14	NP
Ca, Cb:												
Carlisle	0-80	Muck	PT	A-8	0	0	0	0	0	0	---	NP
CcD2:												
Casco	0-7	Gravelly loam	SM, SC-SM	A-2, A-1	0	0-9	55-90	50-75	30-60	15-50	0-20	2-7
	7-17	Clay loam, sandy clay loam, gravelly loam.	SC, CL, GC	A-6, A-7, A-2	0-1	0-9	55-100	50-100	40-90	20-80	25-46	11-26
	17-80	Stratified loamy sand to gravel.	GP, SP, GP-GM, SP-SM	A-1, A-3, A-2	0-3	0-30	25-100	20-95	10-75	2-10	0-14	NP
CeA:												
Celina	0-9	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	26-40	3-10
	9-30	Clay, clay loam, silty clay loam.	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	32-48	12-28
	30-80	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	20-36	4-16
CeB:												
Celina	0-8	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	26-40	3-10
	8-27	Clay, clay loam, silty clay loam.	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	32-48	12-28
	27-80	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	20-36	4-16

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
ChA:												
Celina----------	0-10	Silt loam------	ML	A-4	0	0	100	90-100	90-100	70-85	26-40	3-10
	10-30	Clay, clay loam, silty clay loam.	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	32-48	12-28
	30-80	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	20-36	4-16
Strawn----------	0-10	Silt loam------	CL, ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	90-100	20-40	3-20
	10-23	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	23-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-18
ChB:												
Celina----------	0-10	Silt loam------	ML	A-4	0	0	100	90-100	90-100	70-85	26-40	3-10
	10-30	Clay, clay loam, silty clay loam.	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	32-48	12-28
	30-80	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	20-36	4-16
Strawn----------	0-10	Silty clay loam	CL	A-6, A-7	0	0	90-100	90-100	80-95	80-95	30-45	10-25
	10-23	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-25
	23-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-20
CrA:												
Crosby----------	0-9	Silt loam------	CL, ML, CL-ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	NP-15
	9-25	Clay loam, silty clay loam, clay.	CL, CH	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	30-60	10-35
	25-80	Loam, fine sandy loam.	CL, SM, ML, SC	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-30	NP-15

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CrB:												
Crosby----------	0-9	Silt loam------	CL, ML, CL-ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	NP-15
	9-35	Clay loam, silty clay loam, clay.	CL, CH	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	30-60	10-35
	35-80	Loam, fine sandy loam.	CL, SM, ML, SC	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-30	NP-15
DoE:												
Donnelsville----	0-21	Channery silt loam.	ML, SM, SC-SM	A-4	0-10	5-15	70-85	55-75	50-65	40-55	0-35	NP-7
	21-36	Very channery loam, extremely channery loam, very channery silt loam.	ML, SM, GM	A-4, A-2	10-40	10-65	60-95	40-90	35-80	30-70	0-35	NP-7
	36-47	Extremely channery loam, extremely flaggy loam, extremely stony silt loam.	ML, GM, GM-GC	A-4, A-1-b, A-2-4	15-30	15-70	40-75	25-80	20-80	15-65	0-35	NP-7
	47-50	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
DpF:												
Donnelsville----	0-14	Very channery loam.	SM, GM, GM-GC	A-4, A-2-4	5-15	10-25	55-75	35-55	30-50	25-40	0-35	NP-7
	14-30	Very channery loam, extremely channery loam, extremely flaggy silt loam.	ML, SM, GM	A-4, A-2	10-40	10-65	60-95	40-90	35-80	30-70	0-35	NP-7
	30-55	Extremely channery loam, extremely flaggy loam, extremely stony silt loam.	ML, GM, GM-GC	A-4, A-1-b, A-2-4	15-30	15-70	40-75	25-80	20-80	15-65	0-35	NP-7
	55-58	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
DpF:												
Rock outcrop.												
Dr:												
Drummer	0-15	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	80-100	30-50	15-30
	15-42	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	80-100	30-50	15-30
	42-47	Clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	85-100	50-80	30-50	15-30
	47-80	Sand, gravelly loamy sand, very gravelly sand.	GM, GW-GM, SW-SM, SM	A-1	0	0-5	40-95	30-90	30-50	5-15	0-14	NP
EmA:												
Eldean	0-10	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-40	4-14
	10-31	Clay, clay loam, gravelly clay.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	31-38	Very gravelly loam, loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	38-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
EmB:												
Eldean	0-10	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-40	4-14
	10-31	Gravelly clay, silty clay loam, very gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	31-38	Very gravelly clay loam, loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	38-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EmB2:												
Eldean	0-8	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-40	4-14
	8-18	Clay, sandy clay, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	18-24	Very gravelly loam, loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	24-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
EmC2:												
Eldean	0-9	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-40	4-14
	9-22	Clay, sandy clay, clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	22-28	Very gravelly clay, clay, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	28-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
EnC2:												
Eldean	0-7	Clay loam	CL	A-6, A-4	0	0-5	85-100	75-100	65-100	55-80	25-40	9-18
	7-22	Clay, sandy clay, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	22-28	Very gravelly clay loam, loam, very gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	28-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EnC2:												
Casco	0-7	Gravelly loam	SM, SC-SM	A-2, A-1	0	0-9	55-90	50-75	30-60	15-50	0-20	2-7
	7-19	Clay loam, sandy clay loam, gravelly clay loam.	SC, CL, GC	A-6, A-7, A-2	0-1	0-9	55-100	50-100	40-90	20-80	25-46	11-26
	19-80	Stratified sand to gravel.	GP, SP, GP-GM, SP-SM	A-1, A-3, A-2	0-3	0-30	25-100	20-95	10-75	2-10	0-14	NP
EpB2:												
Eldean	0-7	Silty clay loam	CL	A-6, A-4	0	0-5	85-100	75-100	65-100	55-80	25-40	9-18
	7-21	Clay, clay loam, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	21-26	Very gravelly clay loam, loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	26-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Miamian	0-8	Silty clay loam	CL	A-6, A-7	0	0	90-100	85-100	80-95	70-90	30-45	15-25
	8-29	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	29-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
EpC2:												
Eldean	0-6	Silt loam	CL	A-6, A-4	0	0-5	85-100	75-100	65-100	55-80	25-40	9-18
	6-22	Clay, clay loam, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	22-30	Gravelly clay loam, loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	30-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EpC2:												
Miamian	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	6-27	Silty clay loam, clay loam, clay.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	27-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
EpC3:												
Eldean	0-5	Clay loam	CL	A-6, A-4	0	0-5	85-100	75-100	65-100	55-80	25-40	9-18
	5-20	Clay, sandy clay, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	20-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Miamian	0-7	Clay loam	CL	A-6, A-7	0	0	90-100	85-100	75-95	60-80	30-45	15-25
	7-28	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	28-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
EpD2:												
Eldean	0-6	Silt loam	CL	A-6, A-4	0	0-5	85-100	75-100	65-100	55-80	25-40	9-18
	6-21	Clay, clay loam, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	21-26	Gravelly clay loam, loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	26-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Miamian	0-5	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	5-15	Clay loam, clay, silty clay loam.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	15-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EpD3:												
Eldean	0-5	Clay loam	CL	A-6, A-4	0	0-5	85-100	75-100	65-100	55-80	25-40	9-18
	5-24	Clay, clay loam, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	24-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Miamian	0-6	Clay loam	CL	A-6, A-7	0	0	90-100	85-100	75-95	60-80	30-45	15-25
	6-22	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	22-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
EpE2:												
Eldean	0-3	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-40	4-14
	3-24	Silty clay loam, clay loam, loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	24-35	Very gravelly clay loam, loam, gravelly loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	35-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Miamian	0-5	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	5-37	Clay loam, clay, silty clay loam.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	37-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EsE3:												
Eldean	0-3	Clay loam	CL	A-6, A-4	0	0-5	85-100	75-100	65-100	55-80	25-40	9-18
	3-27	Clay, sandy clay, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	27-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Rodman	0-11	Gravelly loam	ML, CL, SM, SC	A-4	0	0-2	70-85	65-75	60-75	36-65	0-30	3-9
	11-15	Gravelly loam, very gravelly sandy loam, loam.	ML, CL, SC, SM	A-4, A-2, A-1	0	0-2	70-85	60-85	40-75	20-55	0-30	NP-10
	15-80	Stratified sand to extremely gravelly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	0-1	1-5	30-70	22-50	7-20	2-10	0-14	NP
EuB:												
Eldean	0-10	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-40	4-14
	10-25	Silty clay loam, clay loam, gravelly clay.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	25-31	Very gravelly clay loam, loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	31-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Urban land.												

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EuC:												
Eldean	0-9	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-40	4-14
	9-22	Clay, clay loam, gravelly clay loam.	CL, ML	A-7, A-6	0	0-5	75-100	60-100	55-95	50-80	38-50	12-23
	22-35	Very gravelly clay, clay, very gravelly sandy loam.	CL, GC, SC	A-6, A-7, A-2	0	0-10	55-85	45-85	45-75	30-60	38-50	12-23
	35-80	Stratified sand to extremely gravelly coarse sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-14	NP
Urban land.												
Ge:												
Genesee	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-30	5-11
	10-25	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-30	5-11
	25-48	Silt loam, loam	ML, CL, CL-ML	A-4	0	0	100	100	85-100	60-90	0-25	3-8
	48-70	Stratified loam to gravelly loamy coarse sand.	GP, GP-GM, SP, SP-SM	A-1	0	0	30-55	25-45	10-35	1-10	0-14	NP
	70-80	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	20-36	4-16
Gn:												
Genesee	0-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-30	5-11
	11-42	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-30	5-11
	42-52	Silt loam, loam	ML, CL, CL-ML	A-4	0	0	100	100	85-100	60-90	0-25	3-8
	52-70	Stratified sandy loam to gravelly loamy coarse sand.	GP, GP-GM, SP, SP-SM	A-1	0	0	30-55	25-45	10-35	1-10	0-14	NP
	70-80	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	20-36	4-16

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ko:												
Kokomo	0-19	Silty clay loam	CL, CH, ML, MH	A-6, A-7-6	0	0	90-100	85-100	75-100	55-95	35-55	10-30
	19-52	Silty clay loam, clay loam.	CL, CH	A-7, A-7-6	0	0-1	90-100	85-100	75-100	55-95	40-60	20-35
	52-80	Loam	CL, CL-ML, ML, SC	A-6, A-4	0-1	0-3	90-100	85-100	70-95	45-70	15-30	NP-15
Lg:												
Linwood	0-14	Muck	PT	A-8	0	0-20	0	0	0	0	---	NP
	14-36	Muck	PT	A-8	0	0-20	0	0	0	0	---	NP
	36-80	Silt loam, sandy loam, silty clay loam.	CL, ML, SM, SC	A-4, A-6, A-2, A-1	0	0-10	90-100	75-100	45-100	20-95	15-40	NP-20
Lh:												
Linwood	0-9	Mucky silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	70-90	20-30	6-11
	9-28	Muck	PT	A-8	0	0-20	0	0	0	0	---	NP
	28-80	Silt loam, sandy loam, silty clay loam.	CL, ML, SM, SC	A-4, A-6, A-2, A-1	0	0-10	90-100	75-100	45-100	20-95	15-40	NP-20
Lm:												
Lippincott	0-14	Mucky silt loam	CL, CL-ML	A-6	0	0	95-100	90-100	85-100	80-95	20-35	5-15
	14-42	Silt loam, silty clay loam, clay loam.	CH, CL, ML, MH	A-7, A-6	0	0	90-100	80-100	75-100	60-95	35-60	15-35
	42-80	Gravelly loamy sand, gravelly coarse sand, extremely gravelly sand.	GP, GW, SP, SM	A-1	0	0-10	40-65	20-55	10-40	1-20	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Lp:												
Lippincott------	0-13	Silty clay loam	CL, ML	A-6, A-7	0	0	90-100	80-100	75-100	70-95	30-45	10-25
	13-27	Silty clay, clay, clay loam.	CH, CL, ML, MH	A-7, A-6	0	0	90-100	80-100	75-100	60-95	35-60	15-35
	27-34	Very gravelly sandy loam, extremely gravelly coarse sandy loam, gravelly silt loam.	GM, SM, SP-SM, GP-GM	A-1, A-2	0	0-10	40-65	20-55	10-50	5-35	0-25	NP-5
	34-80	Very gravelly loamy sand, extremely gravelly sand.	GP, GW, SP, SM	A-1	0	0-10	40-65	20-55	10-40	1-20	0-14	NP
Lu:												
Lippincott------	0-13	Silty clay loam	CL, ML	A-6, A-7	0	0	90-100	80-100	75-100	70-95	30-45	10-25
	13-23	Silty clay, clay, clay loam.	CH, CL, ML, MH	A-7, A-6	0	0	90-100	80-100	75-100	60-95	35-60	15-35
	23-29	Very gravelly sandy loam, extremely gravelly coarse sandy loam, gravelly silt loam.	GM, SM, SP-SM, GP-GM	A-1, A-2	0	0-10	40-65	20-55	10-50	5-35	0-25	NP-5
	29-80	Very gravelly loamy coarse sand, extremely gravelly sand.	GP, GW, SP, SM	A-1	0	0-10	40-65	20-55	10-40	1-20	0-14	NP
Urban land.												
MgB2:												
Miamian---------	0-8	Silty clay loam	ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	8-25	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	30-50	15-30
	25-47	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
	47-50	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MgC2:												
Miamian	0-7	Silty clay loam	ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	7-25	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	30-50	15-30
	25-53	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
	53-56	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
MgE2:												
Miamian	0-5	Silty clay loam	ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	5-26	Silty clay loam, clay loam, clay.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	30-50	15-30
	26-43	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
	43-46	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
MhA:												
Miamian	0-10	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	10-22	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	22-37	Clay loam, clay, silty clay loam.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	37-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MhB:												
Miamian	0-10	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	10-14	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	14-36	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	36-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MhB2:												
Miamian	0-8	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	8-30	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	30-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MhC:												
Miamian	0-4	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	4-9	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	9-34	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	34-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MhC2:												
Miamian	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	6-27	Clay loam, clay, silty clay loam.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	27-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MhD2:												
Miamian	0-5	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	5-8	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	8-31	Silty clay loam, clay, silt loam.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	31-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MhE:												
Miamian	0-4	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	4-8	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	8-38	Silty clay loam, clay, silt loam.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	38-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MhE2:												
Miamian	0-5	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	5-37	Clay loam, clay, silty clay loam.	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	37-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MkB2:												
Miamian	0-7	Silty clay loam	CL	A-6, A-7	0	0	90-100	85-100	80-95	70-90	30-45	15-25
	7-23	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	23-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MkC2:												
Miamian	0-7	Silty clay loam	CL	A-6, A-7	0	0	90-100	85-100	80-95	70-90	30-45	15-25
	7-23	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	23-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MkD2:												
Miamian	0-6	Silty clay loam	CL	A-6, A-7	0	0	90-100	85-100	80-95	70-90	30-45	15-25
	6-20	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	20-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MmC3:												
Miamian	0-7	Clay loam	CL	A-6, A-7	0	0	90-100	85-100	75-95	60-80	30-45	15-25
	7-19	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	19-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MmD3:												
Miamian	0-5	Clay loam	CL	A-6, A-7	0	0	90-100	85-100	75-95	60-80	30-45	15-25
	5-20	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	18-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MmE3:												
Miamian	0-4	Clay loam	CL	A-6, A-7	0	0	90-100	85-100	75-95	60-80	30-45	15-25
	4-20	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	20-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
MnB:												
Miamian	0-10	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	10-14	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	14-36	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	36-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
Urban land.												
MnC:												
Miamian	0-4	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	25-40	4-12
	4-9	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	30-50	10-25
	9-34	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-50	15-30
	34-80	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	20-35	3-13
Urban land.												

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Mo:												
Milford	0-18	Silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	85-95	35-45	15-25
	18-42	Silty clay loam, clay loam.	CL	A-7	0	0	100	95-100	85-100	60-95	40-50	20-30
	42-55	Stratified silty clay loam to sandy loam.	CL	A-6, A-7, A-4	0	0	95-100	90-100	60-95	60-80	25-45	7-25
	55-80	Stratified silt loam to gravelly coarse sand.	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	50-95	50-80	20-30	7-15
Ms:												
Millsdale	0-12	Silty clay loam	CL	A-6	0	0	90-100	80-100	75-100	70-95	35-40	15-20
	12-34	Silty clay, silty clay loam, clay loam.	CH, CL	A-7	0	0-5	85-100	80-100	75-100	60-80	40-50	20-30
	34-37	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
MtA:												
Milton	0-10	Silt loam	ML, CL	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-36	4-12
	10-23	Silty clay loam, clay loam, clay.	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	32-48	12-28
	23-26	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
MtB:												
Milton	0-9	Silt loam	ML, CL	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-36	4-12
	9-23	Silty clay loam, clay loam, clay.	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	32-48	12-28
	23-31	Clay, sandy clay loam, clay loam.	CH, CL	A-7, A-6	0	0-5	95-100	80-100	70-95	50-90	32-55	14-33
	31-34	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MvC2:												
Milton	0-6	Silty clay loam	CL	A-6, A-7	0	0	95-100	90-100	85-100	75-95	30-45	15-25
	6-22	Silty clay loam, clay loam, clay.	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	32-48	12-28
	22-25	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
MxB:												
Milton	0-9	Silt loam	ML, CL	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-36	4-12
	9-31	Silty clay loam, clay loam, clay.	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	32-48	12-28
	31-34	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
Urban land.												
OcA:												
Ockley	0-9	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	70-100	50-90	23-40	3-15
	9-34	Silt loam, clay loam, silty clay loam.	CL-ML, CL, SC-SM, SC	A-4, A-2, A-6, A-7-6	0	0-1	90-100	85-100	70-100	30-95	20-50	5-35
	34-43	Sandy clay loam, gravelly clay loam, clay loam.	ML, CL, SM, SC	A-2, A-4, A-6, A-7-6	0	0-2	70-85	45-85	25-75	15-60	10-50	NP-35
	43-80	Very gravelly loamy coarse sand, loamy coarse sand.	GW-GM, SW, SP-SM, GP	A-1	0-2	1-10	30-70	20-55	10-30	2-10	---	NP
OcB:												
Ockley	0-9	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	70-100	50-90	23-40	3-15
	9-36	Loam, clay loam, silty clay loam.	CL-ML, CL, SC-SM, SC	A-4, A-2, A-6, A-7-6	0	0-1	90-100	85-100	70-100	30-95	20-50	5-35
	36-49	Sandy clay loam, gravelly sandy clay loam, loam.	ML, CL, SM, SC	A-2, A-4, A-6, A-7-6	0	0-2	70-85	45-85	25-75	15-60	10-50	NP-35
	49-80	Gravelly loamy coarse sand, gravelly coarse sand.	GW-GM, SW, SP-SM, GP	A-1	0-2	1-10	60-100	50-95	30-60	5-10	---	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Pa:												
Patton----------	0-12	Silty clay loam	CL	A-6	0	0	100	100	95-100	80-95	30-40	15-25
	12-36	Silty clay loam, silt loam.	CL, CH, ML, MH	A-7	0	0	100	100	95-100	80-100	40-55	15-25
	36-80	Stratified silt loam to silty clay loam.	CL	A-6	0	0	100	100	95-100	75-95	25-40	10-20
Pg:												
Pits, gravel.												
Ph:												
Pits, quarry.												
RaA:												
Randolph--------	0-10	Silt loam------	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	90-100	75-85	20-38	4-15
	10-25	Clay, silty clay loam, clay loam.	CL, CH	A-7, A-6	0	0-5	75-95	75-95	75-85	70-80	35-60	14-32
	25-28	Unweathered bedrock.	---	---	0	0	0	0	0	0	---	NP
RgE:												
Rodman----------	0-7	Gravelly loam	ML, CL, SM, SC	A-4	0	0-2	70-85	65-75	60-75	36-65	0-30	3-9
	7-12	Gravelly sandy loam, sandy loam, loam.	ML, CL, SC, SM	A-4, A-2, A-1	0	0-2	70-85	60-85	40-75	20-55	0-30	NP-10
	12-80	Stratified sand to extremely gravelly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	0-1	1-5	30-70	22-50	7-20	2-10	0-14	NP
Rn:												
Ross----------	0-10	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0	90-100	90-100	80-100	65-95	20-35	NP-12
	10-66	Loam, silt loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4, A-7	0	0	90-100	85-100	70-100	55-95	22-45	3-20
	66-80	Stratified gravelly sandy loam to silt loam.	CL, ML, SM, GM	A-6, A-4, A-2	0	0-5	65-100	45-100	30-100	25-80	0-30	NP-12

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ro:												
Ross	0-10	Silty clay loam	CL	A-6, A-7	0	0	90-100	90-100	80-100	65-95	35-45	12-20
	10-34	Loam, silt loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4, A-7	0	0	90-100	85-100	70-100	55-95	22-45	3-20
	34-80	Stratified very gravelly sandy loam to silt loam.	CL, ML, SM, GM	A-6, A-4, A-2	0	0-5	65-100	45-100	30-100	25-80	0-30	NP-12
RuA:												
Rush	0-13	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-30	5-15
	13-39	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	90-100	70-100	30-40	10-20
	39-46	Clay loam, sandy clay loam, loam.	CL, SC	A-6, A-2-6	0	1-5	80-100	80-100	60-100	25-75	30-40	10-20
	46-58	Very gravelly sandy loam, gravelly loamy coarse sand.	SC-SM, SC, SP-SC, GC	A-2-4, A-2-6, A-4, A-6	0	1-5	65-85	25-65	25-65	10-50	20-30	5-15
	58-80	Stratified sand to extremely gravelly loamy coarse sand.	SP, SP-SM, GP, GP-GM	A-1	0-1	1-5	30-70	20-55	5-35	2-10	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
ScA:												
Savona----------	0-10	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	75-90	20-35	4-12
	10-36	Clay, silty clay loam, gravelly clay.	CL, CH	A-6, A-7	0	0-5	85-100	75-100	70-100	55-95	35-60	15-30
	36-39	Gravelly silt loam, gravelly clay, gravelly sandy clay loam.	CL, SC, GC	A-4, A-6, A-2, A-7	0	0-10	65-80	50-75	40-70	25-55	30-45	8-20
	39-47	Very gravelly loam, gravelly silt loam, very gravelly sandy loam.	CL, SC, GC, SP-SM	A-1, A-2, A-4, A-6	0	0-10	50-80	30-75	20-70	10-60	20-40	3-20
	47-80	Extremely gravelly loamy coarse sand, very gravelly sand, extremely gravelly coarse sand.	GP, GP-GM, SP, SP-SM	A-1	0	5-25	30-70	20-60	10-40	2-10	0-14	NP
So:												
Sloan----------	0-17	Silt loam------	CL, CL-ML	A-4, A-6	0	0	90-100	85-95	75-95	55-85	20-35	5-15
	17-40	Loam, silty clay loam, clay loam.	CL	A-6, A-7	0	0	85-95	80-95	65-95	50-85	30-50	10-30
	40-56	Stratified sandy loam to silty clay loam.	CL-ML, CL, SC, SC-SM	A-4, A-6, A-7	0	0	85-95	80-95	45-95	35-85	25-45	5-20
	56-80	Very gravelly loamy coarse sand, gravelly sand, gravelly loamy coarse sand.	SP, SP-SM, SM	A-1, A-3, A-2	0	0-5	55-90	50-90	20-60	3-15	0-14	NP
StB2:												
Strawn----------	0-6	Silty clay loam	CL	A-6, A-7	0	0	90-100	90-100	80-95	80-95	30-45	10-25
	6-20	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-25
	20-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
StC2:												
Strawn	0-6	Silty clay loam	CL	A-6, A-7	0	0	90-100	90-100	80-95	80-95	30-45	10-25
	6-20	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-25
	20-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-20
StD2:												
Strawn	0-4	Silty clay loam	CL	A-6, A-7	0	0	90-100	90-100	80-95	80-95	30-45	10-25
	4-16	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-25
	16-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-20
StE2:												
Strawn	0-4	Silty clay loam	CL	A-6, A-7	0	0	90-100	90-100	80-95	80-95	30-45	10-25
	4-15	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-25
	15-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-20
SuA:												
Strawn	0-9	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	90-100	20-40	3-20
	9-18	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	18-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-18
Crosby	0-9	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	NP-15
	9-25	Clay, silty clay loam, silty clay.	CL, CH	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	30-60	10-35
	25-80	Loam, fine sandy loam.	CL, SM, ML, SC	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-30	NP-15

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SuB:												
Strawn	0-10	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	90-100	20-40	3-20
	10-17	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	17-80	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-18
Crosby	0-10	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	NP-15
	10-30	Clay, silty clay loam, silty clay.	CL, CH	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	30-60	10-35
	30-80	Loam, fine sandy loam.	CL, SM, ML, SC	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-30	NP-15
ThA:												
Thackery	0-11	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	90-100	85-100	70-90	22-36	3-14
	11-16	Silt loam, loam, silty clay loam.	CL, ML, CL-ML	A-6, A-4	0	0	100	90-100	80-95	65-90	25-40	6-14
	16-36	Clay loam, sandy clay loam, gravelly clay loam.	CL	A-6, A-4	0	0-2	80-100	75-95	70-85	60-75	25-40	8-18
	36-53	Very gravelly sandy loam, gravelly sandy clay loam, extremely gravelly sandy loam.	GM, SM, SC, GC	A-2, A-4, A-6	0	0-5	50-80	40-70	30-60	25-50	0-35	NP-12
	53-80	Stratified extremely gravelly loamy sand to gravelly sand.	GM, GW, GP, GP-GM	A-1	0	0-5	25-55	15-45	10-35	2-25	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Tr:												
Tremont	0-7	Silty clay loam	ML, CL	A-7, A-6	0	0	95-100	90-100	90-100	80-100	35-50	10-20
	7-29	Clay loam, silty clay loam, loam.	ML, CL	A-6, A-4, A-7	0	0	95-100	90-100	80-100	65-95	30-45	5-20
	29-54	Clay loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-95	60-90	20-35	5-15
	54-80	Gravelly, loam, very gravelly coarse sandy loam.	GW-GM, GM, SM	A-1, A-2-4	0	0-10	50-90	30-75	20-65	10-50	0-20	NP-5
Ts:												
Tremont	0-18	Silt loam	ML, CL	A-7, A-6, A-4	0	0	95-100	90-100	85-100	70-90	30-45	5-15
	18-28	Clay loam, silty clay loam, loam.	ML, CL	A-6, A-4, A-7	0	0	95-100	90-100	80-100	65-95	30-45	5-20
	28-40	Silt loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-95	60-90	20-35	5-15
	40-80	Loam, very gravelly coarse sandy loam, coarse sandy loam.	GW-GM, GM, SM	A-1, A-2-4	0	0-10	50-90	30-75	20-65	10-50	0-20	NP-5
Ud:												
Udorthents.												
Ur:												
Urban land.												

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Wc:												
Wallkill--------	0-6	Silt loam------	ML, SM, OL	A-5, A-7	0	0	95-100	90-100	70-100	40-90	40-50	5-15
	6-19	Silt loam, gravelly loam, silty clay loam.	CL, CL-ML, SC-SM, SC	A-4	0	0	75-100	70-100	60-100	40-90	15-25	5-10
	19-53	Sapric material, coprogenous earth, hemic material.	PT, OL	A-8	0	0	0	0	0	0	0-14	NP
	53-80	Gravelly loam, very gravelly sandy loam.	PT	A-8	0	0	0	0	0	0	0-14	NP
WeA:												
Warsaw----------	0-12	Silt loam------	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	70-100	50-90	20-30	4-12
	12-22	Silty clay loam, loam, clay loam.	SC, CL, CL-ML, SC-SM	A-6, A-2-6, A-4, A-2-4	0	0-3	90-100	85-100	60-90	30-70	20-35	6-15
	22-36	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy loam.	CL, SC, GC, SC-SM	A-6, A-2-6, A-4, A-2-4	0	0-5	70-90	60-85	55-70	30-60	20-35	6-15
	36-80	Stratified sand to very gravelly coarse sand.	SP, GP, SP-SM, GP-GM	A-1	0	1-5	30-70	22-55	7-20	2-10	0-20	NP
WpA:												
Waupecan--------	0-17	Silt loam------	CL	A-4, A-6	0	0	100	100	90-100	85-95	20-35	8-15
	17-35	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-45	15-25
	35-48	Stratified clay loam to gravelly loamy sand.	SM, SC, ML, CL	A-2, A-4	0	0	90-100	65-90	50-70	25-65	0-20	NP-10
	48-80	Sand and gravel, very gravelly coarse sand, gravelly loamy coarse sand.	GP, SP, SP-SM, GP-GM	A-1	0-5	10-35	40-95	30-85	30-50	0-15	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WrA:												
Waynetown-------	0-11	Silt loam------	CL-ML, CL, ML	A-4	0	0	100	95-100	85-100	70-90	0-25	3-8
	11-34	Silty clay loam	CL	A-6	0	0	100	95-100	90-100	80-95	30-40	10-16
	34-45	Loam, clay loam	CL	A-6, A-4	0	0	90-100	90-100	75-100	50-80	25-35	8-14
	45-66	Gravelly loam, gravelly sandy loam, gravelly clay loam.	CL, SC, GC	A-4, A-6, A-2-4, A-2-6	0	0-3	60-85	55-80	45-75	20-55	25-35	8-15
	66-80	Very gravelly coarse sand, gravelly loamy coarse sand.	SP, SP-SM, GP, GP-GM	A-1	0-1	1-5	45-80	45-70	20-50	3-11	0-14	NP
Wt:												
Westland--------	0-11	Silty clay loam	CL, CH, ML, MH	A-6, A-7-6	0	0	90-100	90-100	85-100	75-95	35-55	10-30
	11-35	Clay loam, silty clay loam, very gravelly sandy loam.	CL, SC, CL-ML, SC-SM	A-4, A-6, A-7-6	0	0-5	55-100	45-95	25-85	15-70	20-55	5-35
	35-51	Clay loam, sandy loam, gravelly loam.	SM, SC, ML, CL	A-4, A-6, A-2-4	0	0-5	55-100	45-95	25-85	15-70	10-35	NP-15
	51-80	Very gravelly coarse sand, loamy coarse sand.	SP, SP-SM, GP, GP-GM	A-1, A-1-b	0	0-12	40-75	35-70	10-45	0-10	---	NP

Table 16.--Physical and Chemical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
Ad:															
Adrian	0-22	---	0.30-0.55	0.20-6.00	0.35-0.45	5.1-7.8	125-200	---	---	---	---	2	2	134	55-75
	22-80	2-10	1.40-1.75	6.00-20.00	0.03-0.08	5.6-8.4	1.0-2.0	0-40	Low	0.15	0.15				0.0-1.0
Ae:															
Adrian	0-36	---	0.30-0.55	0.20-6.00	0.35-0.45	5.1-7.8	125-200	---	---	---	---	2	2	134	55-75
	36-80	2-10	1.40-1.75	6.00-20.00	0.03-0.08	5.6-8.4	1.0-2.0	0-40	Low	0.15	0.15				0.0-1.0
Ca, Cb:															
Carlisle	0-80	---	0.13-0.23	0.20-6.00	0.35-0.45	4.5-7.3	150-230	---	---	---	---	5	2	134	70-99
CcD2:															
Casco	0-7	5-15	1.35-1.60	0.60-2.00	0.08-0.12	5.6-7.3	3.0-15.0	---	Low	0.17	0.24	3	3	86	1.0-2.0
	7-17	18-35	1.55-1.65	0.60-2.00	0.09-0.19	5.6-7.8	4.0-30.0	0-3	Moderate	0.32	0.32				0.0-0.5
	17-80	0-2	1.30-1.70	6.00-20.00	0.02-0.04	7.4-8.4	0.0-3.0	1-25	Low	0.10	0.10				0.0-0.5
CeA:															
Celina	0-9	14-26	1.30-1.50	0.60-2.00	0.20-0.24	5.1-7.3	9.0-19.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	9-30	35-48	1.45-1.60	0.20-0.60	0.16-0.19	4.5-7.8	18.0-32.0	0-15	Moderate	0.37	0.37				0.5-1.0
	30-80	16-27	1.60-1.82	0.20-0.60	0.06-0.10	7.4-8.4	8.0-14.0	25-45	Low	0.37	0.49				0.3-0.5
CeB:															
Celina	0-8	14-26	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	9.0-19.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	8-27	35-48	1.45-1.60	0.20-0.60	0.16-0.19	4.5-7.8	18.0-32.0	0-15	Moderate	0.37	0.37				0.5-1.0
	27-80	16-27	1.60-1.82	0.20-0.60	0.06-0.10	7.4-8.4	8.0-14.0	25-45	Low	0.37	0.49				0.3-0.5
ChA:															
Celina	0-10	14-26	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	9.0-19.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	10-30	35-48	1.45-1.60	0.20-0.60	0.16-0.19	4.5-7.8	18.0-32.0	0-15	Moderate	0.37	0.37				0.5-1.0
	30-80	16-27	1.60-1.82	0.20-0.60	0.06-0.10	7.4-8.4	8.0-14.0	25-45	Low	0.37	0.49				0.3-0.5
Strawn	0-10	18-27	1.15-1.45	0.60-2.00	0.20-0.24	6.1-7.3	13.0-22.0	---	Low	0.37	0.37	5	6	48	1.0-3.0
	10-23	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	23-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5
ChB:															
Celina	0-10	14-26	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	9.0-19.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	10-30	35-48	1.45-1.60	0.20-0.60	0.16-0.19	4.5-7.8	18.0-32.0	0-15	Moderate	0.37	0.37				0.5-1.0
	30-80	16-27	1.60-1.82	0.20-0.60	0.06-0.10	7.4-8.4	8.0-14.0	25-45	Low	0.37	0.49				0.3-0.5
Strawn	0-10	27-30	1.35-1.55	0.60-2.00	0.18-0.20	5.6-7.3	18.0-22.0	---	Moderate	0.37	0.37	5	7	38	1.0-2.0
	10-23	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	23-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
CrA:															
Crosby	0-9	10-24	1.30-1.60	0.60-2.00	0.18-0.24	5.1-7.3	6.0-20.0	---	Low	0.43	0.43	4	5	56	1.0-3.0
	9-25	35-45	1.45-1.65	0.60-2.00	0.11-0.16	5.1-7.3	15.0-29.0	---	Moderate	0.28	0.32				0.5-1.0
	25-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	7.4-8.4	4.0-16.0	20-50	Low	0.32	0.43				0.0-0.5
CrB:															
Crosby	0-9	10-24	1.30-1.60	0.60-2.00	0.18-0.24	5.1-7.3	6.0-20.0	---	Low	0.43	0.43	4	5	56	1.0-3.0
	9-35	35-45	1.45-1.65	0.60-2.00	0.11-0.16	5.1-7.3	15.0-29.0	---	Moderate	0.28	0.32				0.5-1.0
	35-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	7.4-8.4	4.0-16.0	20-50	Low	0.32	0.43				0.0-0.5
DoE:															
Donnelsville	0-21	15-24	1.20-1.35	0.60-6.00	0.10-0.01	7.4-8.4	15.0-24.0	30-55	Low	0.17	0.64	3	8	---	5.0-10
	21-36	12-22	1.30-1.50	0.60-2.00	0.03-0.11	7.4-8.4	8.0-15.0	40-65	Low	0.10	0.43				1.0-3.0
	36-47	8-16	1.30-1.50	2.00-6.00	0.02-0.08	7.4-8.4	5.0-10.0	50-65	Low	0.06	0.55				0.0-0.5
	47-50	---	---	---	---	---	---	---		---	---				---
DpF:															
Donnelsville	0-14	15-24	1.20-1.35	0.60-6.00	0.08-0.12	7.4-8.4	15.0-24.0	30-55	Low	0.12	0.37	5	8	---	5.0-10
	14-30	12-22	1.30-1.50	0.60-2.00	0.03-0.11	7.4-8.4	8.0-15.0	40-65	Low	0.10	0.43				1.0-3.0
	30-55	8-16	1.30-1.50	2.00-6.00	0.02-0.08	7.4-8.4	5.0-10.0	50-65	Low	0.06	0.55				0.0-0.5
	55-58	---	---	---	---	---	---	---		---	---				---
Rock outcrop.															
Dr:															
Drummer	0-15	27-35	1.10-1.30	0.60-2.00	0.21-0.23	5.6-7.3	25.0-35.0	---	Moderate	0.28	0.28	4	7	38	5.0-7.0
	15-42	27-35	1.20-1.45	0.60-2.00	0.18-0.20	5.6-7.3	16.0-23.0	---	Moderate	0.28	0.28				0.0-1.0
	42-47	22-33	1.30-1.55	0.60-2.00	0.15-0.19	5.6-7.3	13.0-21.0	---	Moderate	0.28	0.28				0.0-0.5
	47-80	1-8	1.80-2.10	>20.00	0.02-0.04	6.6-8.4	1.0-8.0	---	Low	0.10	---				0.0-0.2
EmA:															
Eldean	0-10	15-25	1.30-1.50	0.60-2.00	0.18-0.22	5.6-7.3	8.0-21.0	---	Low	0.37	0.43	4	5	56	1.0-3.0
	10-31	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	31-38	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	38-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
EmB:															
Eldean	0-10	15-25	1.30-1.50	0.60-2.00	0.18-0.22	5.6-7.3	8.0-21.0	---	Low	0.37	0.43	4	5	56	1.0-3.0
	10-31	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	31-38	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	38-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
EmB2:															
Eldean	0-8	15-25	1.30-1.50	0.60-2.00	0.18-0.22	5.6-7.3	8.0-21.0	---	Low	0.37	0.43	4	5	56	1.0-3.0
	8-18	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	18-24	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	24-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
EmC2:															
Eldean	0-9	15-25	1.30-1.50	0.60-2.00	0.18-0.22	5.6-7.3	8.0-21.0	---	Low	0.37	0.43	4	5	56	1.0-3.0
	9-22	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	22-28	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	28-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
EnC2:															
Eldean	0-7	27-33	1.35-1.55	0.60-2.00	0.16-0.18	5.6-7.3	12.0-24.0	---	Moderate	0.32	0.37	4	6	48	0.5-2.0
	7-22	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	22-28	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	28-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Casco	0-7	5-15	1.35-1.60	0.60-2.00	0.08-0.12	5.6-7.3	3.0-15.0	---	Low	0.17	0.24	3	3	86	1.0-2.0
	7-19	18-35	1.55-1.65	0.60-2.00	0.09-0.19	5.6-7.8	4.0-30.0	0-3	Moderate	0.32	0.32				0.0-0.5
	19-80	0-2	1.30-1.70	6.00-20.00	0.02-0.04	7.4-8.4	0.0-3.0	1-25	Low	0.10	0.10				0.0-0.5
EpB2:															
Eldean	0-7	27-33	1.35-1.55	0.60-2.00	0.16-0.18	5.6-7.3	12.0-24.0	---	Moderate	0.32	0.37	4	6	48	0.5-2.0
	7-21	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	21-26	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	26-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Miamian	0-8	27-32	1.35-1.55	0.20-0.60	0.17-0.23	5.6-7.3	14.0-20.0	---	Moderate	0.37	0.37	4	7	38	0.5-2.0
	8-29	35-48	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	29-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
EpC2:															
Eldean	0-6	15-25	1.35-1.55	0.60-2.00	0.16-0.18	5.6-7.3	12.0-24.0	---	Moderate	0.32	0.37	4	6	48	0.5-2.0
	6-22	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	22-30	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	30-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Miamian	0-6	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	6-27	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	27-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
EpC3:															
Eldean	0-5	27-33	1.35-1.55	0.60-2.00	0.16-0.18	5.6-7.3	12.0-24.0	---	Moderate	0.32	0.37	3	6	48	0.5-2.0
	5-20	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	20-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Miamian	0-7	27-32	1.35-1.55	0.20-0.60	0.16-0.19	4.5-7.3	14.0-20.0	---	Moderate	0.32	0.32	3	6	48	0.5-2.0
	7-28	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	28-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
EpD2:															
Eldean	0-6	15-25	1.35-1.55	0.60-2.00	0.16-0.18	5.6-7.3	12.0-24.0	---	Moderate	0.32	0.37	4	6	48	0.5-2.0
	6-21	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	21-26	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	26-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Miamian	0-5	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	5-15	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	15-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
EpD3:															
Eldean	0-5	27-33	1.35-1.55	0.60-2.00	0.16-0.18	5.6-7.3	12.0-24.0	---	Moderate	0.32	0.37	3	6	48	0.5-2.0
	5-24	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	24-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Miamian	0-6	27-32	1.35-1.55	0.20-0.60	0.16-0.19	4.5-7.3	14.0-20.0	---	Moderate	0.32	0.32	3	6	48	0.5-2.0
	6-22	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	22-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
EpE2:															
Eldean	0-3	15-25	1.30-1.50	0.60-2.00	0.18-0.22	5.6-7.3	8.0-21.0	---	Low	0.37	0.43	4	5	56	1.0-3.0
	3-24	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	24-35	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	35-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Miamian	0-5	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	5-37	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	37-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
EsE3:															
Eldean	0-3	27-33	1.35-1.55	0.60-2.00	0.16-0.18	5.6-7.3	12.0-24.0	---	Moderate	0.32	0.37	4	6	48	0.5-2.0
	3-27	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	27-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Rodman	0-11	8-25	1.20-1.50	2.00-6.00	0.10-0.12	6.6-7.8	5.0-18.0	0-15	Low	0.20	0.32	2	8	---	2.0-4.0
	11-15	5-25	1.10-1.50	2.00-6.00	0.09-0.12	6.6-7.8	1.0-14.0	0-25	Low	0.20	0.32				0.0-2.0
	15-80	0-10	1.60-1.70	>20.00	0.02-0.04	7.4-8.4	1.0-6.0	10-45	Low	0.10	0.37				0.0-1.0
EuB:															
Eldean	0-10	15-25	1.30-1.50	0.60-2.00	0.18-0.22	5.6-7.3	8.0-21.0	---	Low	0.37	0.43	4	5	56	1.0-3.0
	10-25	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	25-31	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	31-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Urban land.															

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
EuC:															
Eldean	0-9	15-25	1.30-1.50	0.60-2.00	0.18-0.22	5.6-7.3	8.0-21.0	---	Low	0.37	0.43	4	5	56	1.0-3.0
	9-22	35-48	1.40-1.60	0.20-2.00	0.08-0.14	5.6-7.8	20.0-30.0	---	Moderate	0.37	0.49				0.5-1.0
	22-35	25-45	1.30-1.60	0.60-2.00	0.07-0.14	6.6-8.4	20.0-30.0	10-50	Low	0.37	0.64				0.5-1.0
	35-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	7.4-8.4	1.0-8.0	40-65	Low	0.10	0.43				0.5-1.0
Urban land.															
Ge:															
Genesee	0-10	17-25	1.30-1.50	0.60-2.00	0.20-0.24	6.6-7.8	9.0-21.0	0-10	Low	0.32	0.32	5	6	48	1.0-3.0
	10-25	17-25	1.30-1.50	0.60-2.00	0.20-0.24	6.6-7.8	8.0-21.0	0-10	Low	0.32	0.32				1.0-3.0
	25-48	10-20	1.30-1.60	0.60-2.00	0.17-0.22	6.6-8.4	8.0-19.0	0-25	Low	0.32	0.32				0.5-1.0
	48-70	0-5	1.50-1.70	0.60-2.00	0.01-0.04	7.4-8.4	5.0-14.0	0-30	Low	0.10	0.32				0.5-1.0
	70-80	15-25	1.60-1.82	0.20-0.60	0.06-0.10	7.4-8.4	0.0-5.0	10-40	Low	0.10	0.37				0.0-0.5
Gn:															
Genesee	0-11	17-25	1.30-1.50	0.60-2.00	0.20-0.24	6.6-7.8	9.0-21.0	0-10	Low	0.32	0.32	5	6	48	1.0-3.0
	11-42	17-25	1.30-1.50	0.60-2.00	0.20-0.24	6.6-7.8	8.0-21.0	0-10	Low	0.32	0.32				1.0-3.0
	42-52	10-20	1.30-1.60	0.60-2.00	0.17-0.22	6.6-8.4	8.0-19.0	0-25	Low	0.32	0.32				0.5-1.0
	52-70	0-5	1.50-1.70	0.60-2.00	0.01-0.04	7.4-8.4	5.0-14.0	0-30	Low	0.10	0.32				0.5-1.0
	70-80	15-25	1.60-1.82	0.20-0.60	0.06-0.10	7.4-8.4	0.0-5.0	10-40	Low	0.10	0.37				0.0-0.5
Ko:															
Kokomo	0-19	27-35	1.30-1.60	0.60-2.00	0.17-0.19	5.6-7.3	16.0-33.0	---	Moderate	0.24	0.24	5	7	38	3.0-6.0
	19-52	35-40	1.40-1.70	0.20-0.60	0.12-0.21	5.6-7.8	16.0-28.0	---	Moderate	0.28	0.32				1.0-2.0
	52-80	16-25	1.50-1.75	0.06-0.20	0.08-0.15	7.4-8.4	6.0-17.0	15-35	Low	0.32	0.37				0.0-1.0
Lg:															
Linwood	0-14	---	0.15-0.40	0.20-6.00	0.35-0.45	4.5-7.8	150-230	---	---	---	---	2	2	134	40-70
	14-36	---	0.15-0.40	0.20-6.00	0.35-0.45	4.5-7.8	150-230	---	---	---	---				50-70
	36-80	5-35	1.60-1.90	0.20-2.00	0.11-0.20	5.6-8.4	2.0-20.0	5-25	Low	0.24	0.28				0.0-0.5
Lh:															
Linwood	0-9	12-20	0.90-1.20	0.60-2.00	0.22-0.24	4.5-7.8	10.0-30.0	---	Low	0.24	0.24	2	5	56	10-20
	9-28	---	0.15-0.40	0.20-6.00	0.35-0.45	4.5-7.8	150-230	---	---	---	---				50-70
	28-80	5-35	1.60-1.90	0.20-2.00	0.11-0.20	5.6-8.4	2.0-20.0	5-25	Low	0.24	0.28				0.0-0.5
Lm:															
Lippincott	0-14	20-27	0.90-1.20	0.60-2.00	0.22-0.30	6.1-7.3	28.0-56.0	---	Low	0.28	0.28	4	6	48	10-20
	14-42	35-50	1.45-1.60	0.60-2.00	0.13-0.17	6.6-7.8	14.0-30.0	---	Moderate	0.28	0.32				0.5-2.0
	42-80	2-10	1.50-1.75	6.00-20.00	0.02-0.04	7.4-8.4	1.0-6.0	40-65	Low	0.10	0.37				0.1-0.5
Lp:															
Lippincott	0-13	27-36	1.35-1.50	0.60-2.00	0.17-0.23	6.1-7.3	20.0-40.0	---	Moderate	0.28	0.32	4	7	38	4.0-8.0
	13-27	35-50	1.45-1.60	0.60-2.00	0.13-0.17	6.6-7.8	14.0-30.0	---	Moderate	0.28	0.32				0.5-2.0
	27-34	5-15	1.50-1.75	6.00-20.00	0.04-0.10	7.4-8.4	2.0-10.0	30-55	Low	0.10	0.37				0.2-0.5
	34-80	2-10	1.50-1.75	6.00-20.00	0.02-0.04	7.4-8.4	1.0-6.0	40-65	Low	0.10	0.37				0.1-0.3

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
Lu:															
Lippincott------	0-13	27-36	1.35-1.50	0.60-2.00	0.17-0.23	6.1-7.3	20.0-40.0	---	Moderate	0.28	0.32	4	7	38	4.0-8.0
	13-23	35-50	1.45-1.60	0.60-2.00	0.13-0.17	6.6-7.8	14.0-30.0	---	Moderate	0.28	0.32				0.5-2.0
	23-29	5-15	1.50-1.75	6.00-20.00	0.04-0.10	7.4-8.4	2.0-10.0	30-55	Low------	0.10	0.37				0.2-0.5
	29-80	2-10	1.50-1.75	6.00-20.00	0.02-0.04	7.4-8.4	1.0-6.0	40-65	Low------	0.10	0.37				0.1-0.3
Urban land.															
MgB2:															
Miamian---------	0-8	28-35	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-20.0	---	Low------	0.37	0.37	5	6	48	1.0-3.0
	8-25	35-48	1.50-1.70	0.20-0.60	0.12-0.18	5.1-7.3	17.0-25.0	---	Moderate	0.37	0.43				0.2-0.5
	25-47	16-31	1.60-1.80	0.20-0.60	0.06-0.10	7.4-8.4	8.0-16.0	25-45	Low------	0.37	0.49				0.1-0.3
	47-50	---	---	0.00-0.60	---	---	---	---		---	---				---
MgC2:															
Miamian---------	0-7	28-35	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-20.0	---	Low------	0.37	0.37	5	6	48	1.0-3.0
	7-25	35-48	1.50-1.70	0.20-0.60	0.12-0.18	5.1-7.3	17.0-25.0	---	Moderate	0.37	0.43				0.2-0.5
	25-53	16-31	1.60-1.80	0.20-0.60	0.06-0.10	7.4-8.4	8.0-16.0	25-45	Low------	0.37	0.49				0.1-0.3
	53-56	---	---	0.00-0.60	---	---	---	---		---	---				---
MgE2:															
Miamian---------	0-5	28-35	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-20.0	---	Low------	0.37	0.37	5	6	48	1.0-3.0
	5-26	35-48	1.50-1.70	0.20-0.60	0.12-0.18	5.1-7.3	17.0-25.0	---	Moderate	0.37	0.43				0.2-0.5
	26-43	16-31	1.60-1.80	0.20-0.60	0.06-0.10	7.4-8.4	8.0-16.0	25-45	Low------	0.37	0.49				0.1-0.3
	43-46	---	---	0.00-0.60	---	---	---	---		---	---				---
MhA:															
Miamian---------	0-10	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low------	0.37	0.37	4	6	48	1.0-3.0
	10-22	25-35	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	22-37	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	37-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low------	0.37	0.49				0.1-0.5
MhB:															
Miamian---------	0-10	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low------	0.37	0.37	4	6	48	1.0-3.0
	10-14	25-35	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	14-36	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	36-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low------	0.37	0.49				0.1-0.5
MhB2:															
Miamian---------	0-8	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low------	0.37	0.37	4	6	48	1.0-3.0
	8-30	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	30-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low------	0.37	0.49				0.1-0.5

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
MhC:															
Miamian	0-4	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	4-9	25-35	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	9-34	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	34-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
MhC2:															
Miamian	0-6	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	6-27	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	27-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
MhD2:															
Miamian	0-5	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	5-8	25-35	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	8-31	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	31-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
MhE:															
Miamian	0-4	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	4-8	25-35	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	8-38	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	38-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
MhE2:															
Miamian	0-5	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	5-37	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	37-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
MkB2:															
Miamian	0-7	27-32	1.35-1.55	0.20-0.60	0.17-0.23	5.6-7.3	14.0-20.0	---	Moderate	0.37	0.37	4	7	38	0.5-2.0
	7-23	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	23-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
MkC2:															
Miamian	0-7	27-32	1.35-1.55	0.20-0.60	0.17-0.23	5.6-7.3	14.0-20.0	---	Moderate	0.37	0.37	4	7	38	0.5-2.0
	7-23	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	23-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
MkD2:															
Miamian	0-6	27-32	1.35-1.55	0.20-0.60	0.17-0.23	5.6-7.3	14.0-20.0	---	Moderate	0.37	0.37	4	7	38	0.5-2.0
	6-20	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	20-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
MmC3:															
Miamian	0-7	27-32	1.35-1.55	0.20-0.60	0.16-0.19	4.5-7.3	14.0-20.0	---	Moderate	0.32	0.32	3	6	48	0.3-1.0
	7-19	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.1-0.5
	19-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.0-0.5
MmD3:															
Miamian	0-5	27-32	1.35-1.55	0.20-0.60	0.16-0.19	4.5-7.3	14.0-20.0	---	Moderate	0.32	0.32	3	6	48	0.3-1.0
	5-20	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.1-0.5
	18-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.0-0.5
MmE3:															
Miamian	0-4	27-32	1.35-1.55	0.20-0.60	0.16-0.19	4.5-7.3	14.0-20.0	---	Moderate	0.32	0.32	3	6	48	0.3-1.0
	4-20	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.1-0.5
	20-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.0-0.5
MnB:															
Miamian	0-10	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	10-14	25-35	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	14-36	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	36-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
Urban land.															
MnC:															
Miamian	0-4	14-27	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-18.0	---	Low	0.37	0.37	4	6	48	1.0-3.0
	4-9	25-35	1.40-1.60	0.20-0.60	0.16-0.20	5.1-7.3	12.0-22.0	---	Moderate	0.37	0.43				0.5-1.0
	9-34	35-48	1.45-1.70	0.20-0.60	0.12-0.17	5.1-7.8	17.0-28.0	0-15	Moderate	0.37	0.43				0.3-1.0
	34-80	16-31	1.60-1.85	0.20-0.60	0.06-0.10	7.4-8.4	7.0-16.0	25-45	Low	0.37	0.49				0.1-0.5
Urban land.															
Mo:															
Milford	0-18	30-40	1.35-1.45	0.60-2.00	0.21-0.23	6.1-7.8	26.0-36.0	---	Moderate	0.28	0.28	5	4	86	4.0-6.0
	18-42	35-40	1.40-1.60	0.20-0.60	0.15-0.20	5.6-7.3	22.0-29.0	---	Moderate	0.28	0.28				0.5-2.0
	42-55	18-35	1.50-1.60	0.20-0.60	0.15-0.21	6.6-7.8	4.0-18.0	0-10	Moderate	0.28	0.28				0.0-1.0
	55-80	0-15	1.50-1.60	2.00-6.00	0.18-0.22	7.4-8.4	1.0-15.0	5-30	Low	0.28	0.28				0.0-1.0
Ms:															
Millsdale	0-12	27-35	1.30-1.50	0.60-2.00	0.17-0.22	6.1-7.3	20.0-36.0	---	Moderate	0.28	0.32	2	7	38	4.0-7.0
	12-34	35-45	1.40-1.65	0.20-0.60	0.12-0.16	6.1-8.4	15.0-30.0	0-10	High	0.32	0.37				0.5-2.0
	34-37	---	---	0.00-0.60	---	---	---	---	---	---	---				---
MtA:															
Milton	0-10	14-27	1.30-1.50	0.60-2.00	0.18-0.23	4.5-7.3	10.0-22.0	---	Low	0.37	0.37	2	6	48	1.0-3.0
	10-23	35-50	1.45-1.65	0.20-2.00	0.12-0.18	4.5-7.8	16.0-30.0	---	Moderate	0.37	0.43				0.3-1.0
	23-26	---	---	0.06-0.60	---	---	---	---	---	---	---				---

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
MtB:															
Milton	0-9	14-27	1.30-1.50	0.60-2.00	0.18-0.23	4.5-7.3	10.0-22.0	---	Low	0.37	0.37	2	6	48	1.0-3.0
	9-23	35-50	1.45-1.65	0.20-2.00	0.12-0.18	4.5-7.8	16.0-30.0	---	Moderate	0.37	0.43				0.3-1.0
	23-31	25-45	1.40-1.70	0.20-2.00	0.12-0.16	6.1-8.4	10.0-27.0	5-15	Moderate	0.37	0.43				0.1-0.3
	31-34	---	---	0.06-0.60	---	---	---	---	---	---	---				---
MvC2:															
Milton	0-6	27-32	1.35-1.55	0.60-2.00	0.19-0.23	4.5-7.3	16.0-24.0	---	Moderate	0.37	0.37	2	7	38	0.5-2.0
	6-22	35-50	1.45-1.65	0.20-2.00	0.12-0.18	4.5-7.8	16.0-30.0	---	Moderate	0.37	0.43				0.3-1.0
	22-25	---	---	0.06-0.60	---	---	---	---	---	---	---				---
MxB:															
Milton	0-9	14-27	1.30-1.50	0.60-2.00	0.18-0.23	4.5-7.3	10.0-22.0	---	Low	0.37	0.37	2	6	48	1.0-3.0
	9-31	35-50	1.45-1.65	0.20-2.00	0.12-0.18	4.5-7.8	16.0-30.0	---	Moderate	0.37	0.43				0.3-1.0
	31-34	---	---	0.06-0.60	---	---	---	---	---	---	---				---
Urban land.															
OcA:															
Ockley	0-9	11-22	1.30-1.60	0.60-2.00	0.16-0.24	5.6-7.3	3.0-15.0	---	Low	0.32	0.37	4	5	56	1.0-3.0
	9-34	22-34	1.40-1.60	0.60-2.00	0.13-0.20	4.5-6.5	5.0-15.0	---	Moderate	0.32	0.37				0.5-1.0
	34-43	10-32	1.40-1.70	0.60-6.00	0.05-0.20	5.1-7.3	2.0-15.0	---	Moderate	0.10	0.20				0.5-1.0
	43-80	2-5	1.60-1.80	>20.00	0.02-0.04	7.4-8.4	1.0-3.0	20-50	Low	0.02	0.10				0.0-0.5
OcB:															
Ockley	0-9	11-22	1.30-1.60	0.60-2.00	0.16-0.24	5.6-7.3	3.0-15.0	---	Low	0.32	0.37	4	5	56	1.0-3.0
	9-36	22-34	1.40-1.60	0.60-2.00	0.13-0.20	4.5-6.5	5.0-15.0	---	Moderate	0.32	0.37				0.5-1.0
	36-49	10-32	1.40-1.70	0.60-6.00	0.05-0.20	5.1-7.3	2.0-15.0	---	Moderate	0.10	0.20				0.5-1.0
	49-80	2-5	1.60-1.80	>20.00	0.02-0.04	7.4-8.4	1.0-3.0	20-50	Low	0.02	0.10				0.0-0.5
Pa:															
Patton	0-12	27-35	1.15-1.35	0.60-2.00	0.21-0.23	6.6-7.3	22.0-31.0	---	Moderate	0.28	0.28	5	7	38	3.0-5.0
	12-36	27-35	1.25-1.45	0.60-2.00	0.18-0.20	6.1-8.4	18.0-27.0	---	Moderate	0.43	0.43				1.0-3.0
	36-80	22-35	1.30-1.50	0.20-0.60	0.18-0.22	7.4-8.4	14.0-23.0	---	Moderate	0.43	0.43				0.5-1.0
Pg:															
Pits, gravel.															
Ph:															
Pits, quarry.															
RaA:															
Randolph	0-10	16-27	1.30-1.45	0.60-2.00	0.17-0.22	5.1-7.3	8.0-22.0	---	Low	0.37	0.37	2	6	48	1.0-3.0
	10-25	35-50	1.40-1.65	0.20-0.60	0.13-0.16	5.1-7.8	14.0-30.0	0-15	Moderate	0.37	0.43				0.3-1.0
	25-28	---	---	0.06-0.60	---	---	---	---	---	---	---				---

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
RgE:															
Rodman	0-7	8-25	1.20-1.50	2.00-6.00	0.10-0.12	6.6-8.4	5.0-18.0	0-15	Low	0.20	0.32	3	8	---	2.0-4.0
	7-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	6.6-8.4	1.0-14.0	0-25	Low	0.20	0.32				0.0-2.0
	12-80	0-10	1.60-1.70	>20.00	0.02-0.04	7.4-8.4	1.0-6.0	10-45	Low	0.10	0.37				0.0-1.0
Rn:															
Ross	0-10	15-27	1.20-1.45	0.60-2.00	0.19-0.24	6.1-7.8	12.0-26.0	---	Low	0.32	0.32	5	5	56	3.0-5.0
	10-66	18-32	1.20-1.50	0.60-2.00	0.16-0.22	6.1-8.4	8.0-20.0	0-20	Low	0.32	0.32				1.0-3.0
	66-80	5-25	1.35-1.60	0.60-6.00	0.05-0.18	6.1-8.4	2.0-15.0	0-30	Low	0.32	0.49				0.5-2.0
Ro:															
Ross	0-10	27-32	1.25-1.50	0.60-2.00	0.18-0.22	6.1-8.4	17.0-29.0	---	Moderate	0.32	0.32	5	7	38	3.0-5.0
	10-34	18-32	1.20-1.50	0.60-2.00	0.16-0.22	6.1-8.4	8.0-20.0	0-20	Low	0.32	0.32				1.0-3.0
	34-80	5-25	1.35-1.60	0.60-6.00	0.05-0.18	6.1-8.4	2.0-15.0	0-30	Low	0.32	0.49				0.5-2.0
RuA:															
Rush	0-13	10-20	1.25-1.40	0.60-2.00	0.22-0.24	5.1-7.3	5.0-16.0	---	Low	0.37	0.37	5	5	56	0.5-2.0
	13-39	22-30	1.35-1.50	0.60-2.00	0.18-0.20	4.5-6.5	9.0-20.0	---	Moderate	0.37	0.37				0.5-1.0
	39-46	20-30	1.40-1.55	0.60-2.00	0.15-0.19	4.5-6.5	9.0-20.0	---	Moderate	0.37	0.43				0.2-1.0
	46-58	8-10	1.40-1.55	0.60-2.00	0.04-0.10	6.6-7.8	3.0-7.0	0-10	Low	0.24	0.64				0.0-0.5
	58-80	2-6	1.60-1.80	>20.00	0.02-0.04	7.4-8.4	1.0-5.0	10-35	Low	0.10	0.37				0.0-0.5
ScA:															
Savona	0-10	10-25	1.25-1.45	0.60-2.00	0.20-0.24	5.1-7.3	10.0-21.0	---	Low	0.37	0.37	4	5	56	0.5-3.0
	10-36	35-42	1.30-1.50	0.20-2.00	0.08-0.17	5.1-7.3	14.0-25.0	---	Moderate	0.37	0.43				0.3-1.0
	36-39	20-30	1.25-1.45	0.20-2.00	0.12-0.17	6.1-7.8	8.0-18.0	---	Low	0.24	0.49				0.1-0.5
	39-47	20-35	1.25-1.45	0.60-2.00	0.10-0.17	7.4-8.4	8.0-21.0	10-50	Low	0.24	0.55				0.1-0.5
	47-80	2-10	1.20-1.50	6.00-20.00	0.02-0.05	7.9-8.4	1.0-6.0	40-65	Low	0.10	0.43				0.1-0.3
So:															
Sloan	0-17	15-27	1.20-1.40	0.60-2.00	0.19-0.24	6.1-7.8	13.0-26.0	---	Low	0.28	0.32	4	6	48	3.0-6.0
	17-31	20-35	1.25-1.55	0.20-2.00	0.17-0.20	6.1-8.4	10.0-18.0	0-10	Moderate	0.37	0.43				0.5-1.0
	31-56	10-30	1.25-1.55	0.20-2.00	0.19-0.21	6.6-8.4	5.0-15.0	0-20	Low	0.37	0.43				0.3-1.0
	56-80	0-10	1.20-1.50	6.00-20.00	0.02-0.05	6.6-8.4	2.0-8.0	15-25	Low	0.10	0.17				0.1-0.5
StB2:															
Strawn	0-6	27-30	1.35-1.55	0.60-2.00	0.18-0.20	5.6-7.3	18.0-22.0	---	Moderate	0.37	0.37	5	7	38	1.0-2.0
	6-20	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	20-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5
StC2:															
Strawn	0-6	27-30	1.35-1.55	0.60-2.00	0.18-0.20	5.6-7.3	18.0-22.0	---	Moderate	0.37	0.37	5	7	38	1.0-2.0
	6-20	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	20-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
StD2:															
Strawn	0-4	27-30	1.35-1.55	0.60-2.00	0.18-0.20	5.6-7.3	18.0-22.0	---	Moderate	0.37	0.37	5	7	38	1.0-2.0
	4-16	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	16-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5
StE2:															
Strawn	0-4	27-30	1.35-1.55	0.60-2.00	0.18-0.20	5.6-7.3	18.0-22.0	---	Moderate	0.37	0.37	5	7	38	1.0-2.0
	4-15	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	15-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5
SuA:															
Strawn	0-9	18-27	1.15-1.45	0.60-2.00	0.20-0.24	6.1-7.3	13.0-22.0	---	Low	0.37	0.37	5	6	48	1.0-3.0
	9-18	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	18-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5
Crosby	0-9	10-24	1.30-1.60	0.60-2.00	0.18-0.24	5.1-7.3	6.0-20.0	---	Low	0.43	0.43	4	5	56	1.0-3.0
	9-25	35-45	1.45-1.65	0.60-2.00	0.11-0.16	5.1-7.3	15.0-29.0	---	Moderate	0.28	0.32				0.5-1.0
	25-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	7.4-8.4	4.0-16.0	20-50	Low	0.32	0.43				0.0-0.5
SuB:															
Strawn	0-10	18-27	1.15-1.45	0.60-2.00	0.20-0.24	6.1-7.3	13.0-22.0	---	Low	0.37	0.37	5	6	48	1.0-3.0
	10-17	27-35	1.35-1.55	0.60-2.00	0.15-0.20	5.6-7.8	16.0-23.0	---	Moderate	0.37	0.43				0.2-1.0
	17-80	22-30	1.50-1.70	0.20-0.60	0.08-0.12	7.4-8.4	12.0-19.0	5-30	Low	0.32	0.32				0.2-0.5
Crosby	0-10	10-24	1.30-1.60	0.60-2.00	0.18-0.24	5.1-7.3	6.0-20.0	---	Low	0.43	0.43	4	5	56	1.0-3.0
	10-30	35-45	1.45-1.65	0.60-2.00	0.11-0.16	5.1-7.3	15.0-29.0	---	Moderate	0.28	0.32				0.5-1.0
	30-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	7.4-8.4	4.0-16.0	20-50	Low	0.32	0.43				0.0-0.5
ThA:															
Thackery	0-11	15-25	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	8.0-21.0	---	Low	0.37	0.37	4	5	56	1.0-3.0
	11-16	20-30	1.30-1.55	0.60-2.00	0.17-0.22	5.1-6.5	8.0-20.0	---	Low	0.37	0.37				0.5-1.0
	16-36	25-35	1.35-1.60	0.60-2.00	0.13-0.18	5.1-7.8	10.0-21.0	---	Moderate	0.37	0.43				0.3-0.5
	36-53	15-27	1.25-1.55	2.00-6.00	0.04-0.10	6.1-7.8	6.0-16.0	10-45	Low	0.10	0.24				0.2-0.5
	53-80	2-12	1.60-1.80	6.00-20.00	0.02-0.06	7.4-7.8	1.0-6.0	30-55	Low	0.10	0.49				0.1-0.3
Tr:															
Tremont	0-7	27-35	1.25-1.50	0.60-2.00	0.20-0.23	7.4-8.4	20.0-24.0	5-15	Low	0.28	0.28	4	4L	86	4.0-7.0
	7-29	22-35	1.25-1.50	0.60-2.00	0.18-0.22	7.4-8.4	16.0-24.0	3-12	Moderate	0.28	0.24				2.0-5.0
	29-54	18-32	1.35-1.55	0.60-2.00	0.15-0.22	7.4-8.4	16.0-24.0	3-12	Low	0.32	0.37				0.1-1.0
	54-80	5-15	1.50-1.75	2.00-6.00	0.06-0.12	7.4-8.4	6.0-12.0	40-60	Low	0.32	0.37				0.1-0.5
Ts:															
Tremont	0-18	20-27	1.20-1.45	0.60-2.00	0.20-0.24	7.4-8.4	20.0-24.0	5-15	Low	0.28	0.28	4	4L	86	4.0-7.0
	18-28	22-35	1.25-1.50	0.60-2.00	0.18-0.22	7.4-8.4	16.0-24.0	3-12	Moderate	0.28	0.24				2.0-5.0
	28-40	18-32	1.35-1.55	0.60-2.00	0.15-0.22	7.4-8.4	16.0-24.0	3-12	Low	0.32	0.37				0.1-1.0
	40-80	5-15	1.50-1.75	2.00-6.00	0.06-0.12	7.4-8.4	6.0-12.0	40-60	Low	0.32	0.37				0.1-0.5

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Cation-exchange capacity	Calcium carbonate	Shrink-swell potential	Erosion factors			Wind erodibility group	Wind erodibility index	Organic matter
										K	Kf	T			
	In	Pct	g/cc	In/hr	In/in	pH	meq/100g	Pct							Pct
Ud:															
Udorthents.															
Ur:															
Urban land.															
Wc:															
Wallkill	0-6	10-27	1.15-1.40	0.60-2.00	0.16-0.21	5.1-7.8	14.0-40.0	---	Low	0.37	0.37	5	5	56	4.0-12
	6-19	15-27	1.15-1.45	0.60-2.00	0.15-0.20	5.1-7.8	14.0-40.0	---	Low	0.37	0.37				---
	19-53	---	0.25-0.45	2.00-20.00	0.35-0.45	5.1-7.8	125-200	---	---	---	---				---
	53-80	---	0.25-0.45	2.00-20.00	0.35-0.45	5.6-7.8	125-200	---	---	---	---				---
WeA:															
Warsaw	0-12	15-25	1.30-1.50	0.60-2.00	0.20-0.24	5.6-7.3	10.0-25.0	---	Low	0.28	0.28	4	5	56	2.0-5.0
	12-22	17-30	1.35-1.60	0.60-2.00	0.16-0.19	5.1-6.5	7.0-22.0	---	Low	0.28	0.32				0.5-2.0
	22-36	18-30	1.40-1.65	0.60-2.00	0.13-0.16	6.1-8.4	9.0-22.0	0-10	Low	0.28	0.43				0.5-2.0
	36-80	2-8	1.40-1.65	>20.00	0.02-0.04	7.9-8.4	1.0-7.0	15-25	Low	0.10	0.37				0.0-1.0
WpA:															
Waupecan	0-17	15-27	1.15-1.30	0.60-2.00	0.22-0.24	5.1-7.8	17.0-26.0	---	Low	0.32	0.32	4	6	48	4.0-5.0
	17-35	25-35	1.30-1.50	0.60-2.00	0.18-0.22	5.1-7.3	16.0-23.0	---	Moderate	0.43	0.43				0.5-1.0
	35-48	10-25	1.55-1.75	2.00-6.00	0.08-0.18	5.1-7.3	6.0-16.0	---	Low	0.10	0.17				0.2-0.5
	48-80	3-10	1.60-1.80	>20.00	0.02-0.04	6.6-8.4	2.0-8.0	0-20	Low	0.10	0.15				0.2-0.5
WrA:															
Waynetown	0-11	10-20	1.30-1.45	0.60-2.00	0.22-0.24	5.1-7.3	5.0-16.0	---	Low	0.37	0.37	5	5	56	0.5-2.0
	11-34	27-35	1.55-1.65	0.60-2.00	0.18-0.22	5.6-6.5	10.0-21.0	---	Moderate	0.37	0.37				0.2-0.5
	34-45	20-35	1.40-1.65	0.60-2.00	0.13-0.17	5.6-7.3	8.0-17.0	---	Moderate	0.37	0.37				0.1-0.5
	45-66	20-30	1.50-1.65	0.60-2.00	0.06-0.13	6.6-8.4	8.0-18.0	0-10	Moderate	0.28	0.49				0.1-0.5
	66-80	1-5	1.60-1.80	>20.00	0.02-0.04	7.9-8.4	1.0-5.0	20-30	Low	0.10	0.24				0.1-0.5
Wt:															
Westland	0-11	27-34	1.40-1.60	0.60-2.00	0.20-0.23	6.1-7.3	15.0-31.0	---	Moderate	0.24	0.24	4	7	38	2.0-5.0
	11-35	5-28	1.40-1.65	0.60-2.00	0.13-0.19	6.1-7.3	9.0-22.0	---	Moderate	0.28	0.32				0.5-2.0
	35-51	5-18	1.55-1.70	0.60-2.00	0.07-0.17	6.6-7.8	3.0-15.0	0-25	Low	0.24	0.37				0.5-2.0
	51-80	1-10	1.70-2.10	>20.00	0.01-0.04	7.4-8.4	0.0-2.0	25-45	Low	0.05	0.10				0.0-0.5

Table 17.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
Ad, Ae:							
Adrian	>60	---	6-18	29-33	High	High	Moderate.
Ca, Cb:							
Carlisle	>60	---	---	43-54	High	High	Low.
CcD2:							
Casco	>60	---	---	---	Low	Moderate	Low.
CeA, CeB:							
Celina	>60	---	---	---	High	High	Moderate.
ChA, ChB:							
Celina	>60	---	---	---	High	High	Moderate.
Strawn	>60	---	---	---	Moderate	Moderate	Moderate.
CrA, CrB:							
Crosby	>60	---	---	---	High	High	Moderate.
DoE:							
Donnelsville	40-60	Hard	---	---	Moderate	Low	Low.
DpF:							
Donnelsville	40-60	Hard	---	---	Moderate	Low	Low.
Rock outcrop.							
Dr:							
Drummer	>60	---	---	---	High	High	Moderate.
EmA, EmB, EmB2, EmC2:							
Eldean	>60	---	---	---	Moderate	High	Moderate.
EnC2:							
Eldean	>60	---	---	---	Moderate	High	Moderate.
Casco	>60	---	---	---	Low	Moderate	Low.
EpB2, EpC2, EpC3, EpD2, EpD3, EpE2:							
Eldean	>60	---	---	---	Moderate	High	Moderate.
Miamian	>60	---	---	---	Moderate	Moderate	Moderate.
EsE3:							
Eldean	>60	---	---	---	Moderate	High	Moderate.
Rodman	>60	---	---	---	Low	Low	Low.
EuB, EuC:							
Eldean	>60	---	---	---	Moderate	High	Moderate.
Urban land.							

Table 17.--Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
Ge, Gn:							
Genesee	>60	---	---	---	Moderate	Low	Low.
Ko:							
Kokomo	>60	---	---	---	High	High	Moderate.
Lg, Lh:							
Linwood	>60	---	---	15-40	High	Moderate	Low.
Lm, Lp:							
Lippincott	>60	---	---	---	Moderate	High	Low.
Lu:							
Lippincott	>60	---	---	---	Moderate	High	Low.
Urban land.							
MgB2, MgC2, MgE2:							
Miamian	40-60	Hard	---	---	Moderate	Moderate	Moderate.
MhA, MhB, MhB2, MhC, MhC2, MhD2, MhE, MhE2, MkB2, MkC2, MkD2, MmC3, MmD3, MmE3:							
Miamian	>60	---	---	---	Moderate	Moderate	Moderate.
MnB, MnC:							
Miamian	>60	---	---	---	Moderate	Moderate	Moderate.
Urban land.							
Mo:							
Milford	>60	---	---	---	High	High	Low.
Ms:							
Millsdale	20-40	Hard	---	---	High	High	Low.
MtA, MtB, MvC2:							
Milton	20-40	Hard	---	---	Moderate	High	Moderate.
MxB:							
Milton	20-40	Hard	---	---	Moderate	High	Moderate.
Urban land.							
OcA, OcB:							
Ockley	>60	---	---	---	Moderate	Moderate	Moderate.
Pa:							
Patton	>60	---	---	---	High	High	Low.
Pg:							
Pits, gravel.							
Ph:							
Pits, quarry.							
RaA:							
Randolph	20-40	Hard	---	---	High	High	Moderate.

Table 17.--Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
RgE:							
Rodman	>60	---	---	---	Low	Low	Low.
Rn, Ro:							
Ross	>60	---	---	---	Moderate	Low	Low.
RuA:							
Rush	>60	---	---	---	High	Moderate	Moderate.
ScA:							
Savona	>60	---	---	---	High	High	Low.
So:							
Sloan	>60	---	---	---	High	High	Low.
StB2, StC2, StD2, StE2:							
Strawn	>60	---	---	---	Moderate	Moderate	Moderate.
SuA, SuB:							
Strawn	>60	---	---	---	Moderate	Moderate	Moderate.
Crosby	>60	---	---	---	High	High	Moderate.
ThA:							
Thackery	>60	---	---	---	High	Moderate	Moderate.
Tr, Ts:							
Tremont	>60	---	---	---	High	Moderate	Low.
Ud:							
Udorthents	>60	---	---	---	Moderate	High	Moderate.
Ur:							
Urban land.							
Wc:							
Wallkill	>60	---	---	---	High	Moderate	Moderate.
WeA:							
Warsaw	>60	---	---	---	Moderate	Low	Moderate.
WpA:							
Waupecan	>60	---	---	---	High	Moderate	Moderate.
WrA:							
Waynetown	>60	---	---	---	High	High	Moderate.
Wt:							
Westland	>60	---	---	---	High	High	Low.

Table 18.--Water Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				Maximum ponding depth
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	
					Ft				Ft
Ad, Ae:									
Adrian	A/D	None	---	---	+1-1.0	Apparent	Nov-May	Very long	1.0
Ca, Cb:									
Carlisle	A/D	None	---	---	+.5-1.0	Apparent	Sep-Jun	Very long	0.5
CcD2:									
Casco	B	None	---	---	>6.0	---	---	---	---
CeA, CeB:									
Celina	C	None	---	---	2.0-3.5	Perched	Jan-Apr	---	---
ChA, ChB:									
Celina	C	None	---	---	2.0-3.5	Perched	Jan-Apr	---	---
Strawn	B	None	---	---	>6.0	---	---	---	---
CrA, CrB:									
Crosby	C	None	---	---	0.5-1.5	Perched	Dec-Apr	---	---
DoE:									
Donnelsville	B	None	---	---	>6.0	---	---	---	---
DpF:									
Donnelsville	B	None	---	---	>6.0	---	---	---	---
Rock outcrop.									
Dr:									
Drummer	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	Very long	0.5
EmA, EmB, EmB2, EmC2:									
Eldean	B	None	---	---	>6.0	---	---	---	---
EnC2:									
Eldean	B	None	---	---	>6.0	---	---	---	---
Casco	B	None	---	---	>6.0	---	---	---	---
EpB2, EpC2, EpC3, EpD2, EpD3, EpE2:									
Eldean	B	None	---	---	>6.0	---	---	---	---
Miamian	C	None	---	---	>6.0	---	---	---	---
EsE3:									
Eldean	B	None	---	---	>6.0	---	---	---	---
Rodman	A	None	---	---	>6.0	---	---	---	---
EuB, EuC:									
Eldean	B	None	---	---	>6.0	---	---	---	---
Urban land.									

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				Maximum ponding depth
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	
					Ft				Ft
Ge:									
Genesee	B	Rare	---	---	3.0-6.0	Apparent	Jan-Apr	---	---
Gn:									
Genesee	B	Occasional	Brief	Nov-May	3.0-6.0	Apparent	Jan-Apr	---	---
Ko:									
Kokomo	B/D	None	---	---	+2-0.5	Apparent	Dec-May	Very long	2.0
Lg, Lh:									
Linwood	A/D	None	---	---	+1-1.0	Apparent	Nov-Jun	Very long	1.0
Lm, Lp:									
Lippincott	B/D	None	---	---	+1-1.0	Apparent	Dec-May	Very long	1.0
Lu:									
Lippincott	B/D	None	---	---	+1-1.0	Apparent	Dec-May	Very long	1.0
Urban land.									
MgB2, MgC2, MgE2, MhA, MhB, MhB2, MhC, MhC2, MhD2, MhE, MhE2, MkB2, MkC2, MkD2, MmC3, MmD3, MmE3:									
Miamian	C	None	---	---	>6.0	---	---	---	---
MnB, MnC:									
Miamian	C	None	---	---	>6.0	---	---	---	---
Urban land.									
Mo:									
Milford	B/D	None	---	---	+.5-1.0	Apparent	Dec-Jun	Very long	0.5
Ms:									
Millsdale	C/D	None	---	---	+1-1.0	Perched	Jan-Apr	Very long	1.0
MtA, MtB, MvC2:									
Milton	C	None	---	---	>6.0	---	---	---	---
MxB:									
Milton	C	None	---	---	>6.0	---	---	---	---
Urban land.									
OcA, OcB:									
Ockley	B	None	---	---	>6.0	---	---	---	---
Pa:									
Patton	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	Very long	0.5
Pg:									
Pits, gravel.									
Ph:									
Pits, quarry.									

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				Maximum ponding depth
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	
					Ft				Ft
RaA:									
Randolph	C	None	---	---	1.0-2.5	Perched	Jan-Apr	---	---
RgE:									
Rodman	A	None	---	---	>6.0	---	---	---	---
Rn:									
Ross	B	Occasional	Brief	Nov-Jun	4.0-6.0	Apparent	Feb-Apr	---	---
Ro:									
Ross	B	Rare	---	---	4.0-6.0	Apparent	Feb-Apr	---	---
RuA:									
Rush	B	None	---	---	>6.0	---	---	---	---
ScA:									
Savona	C	None	---	---	1.0-2.5	Apparent	Dec-Apr	---	---
So:									
Sloan	B/D	Occasional	Brief	Nov-Jun	0.0-1.0	Apparent	Nov-Jun	---	---
StB2, StC2, StD2, StE2:									
Strawn	B	None	---	---	>6.0	---	---	---	---
SuA, SuB:									
Strawn	B	None	---	---	>6.0	---	---	---	---
Crosby	C	None	---	---	0.5-1.5	Perched	Dec-Apr	---	---
ThA:									
Thackery	B	None	---	---	2.0-3.5	Apparent	Jan-Apr	---	---
Tr:									
Tremont	B	Rare	---	---	1.5-3.0	Apparent	Jan-Apr	---	---
Ts:									
Tremont	B	Occasional	Brief	Nov-Jun	1.5-3.0	Apparent	Jan-Apr	---	---
Ud:									
Udorthents	B	None	---	---	>6.0	---	---	---	---
Ur:									
Urban land.									
Wc:									
Wallkill	C/D	Occasional	Very long	Sep-Jun	+.5-1.0	Apparent	Sep-Jun	Very long	0.5
WeA:									
Warsaw	B	None	---	---	>6.0	---	---	---	---
WpA:									
Waupecan	B	None	---	---	>6.0	---	---	---	---
WrA:									
Waynetown	C	None	---	---	0.5-2.0	Apparent	Dec-May	---	---
Wt:									
Westland	B/D	None	---	---	+1-1.0	Apparent	Dec-May	Very long	1.0

Interpretive Groups

Interpretive Groups

(Unless otherwise indicated, a complex is treated as a single management unit in the "Land capability," "Pasture and hayland," and "Prime farmland" columns. See text for definitions of the groups. Absence of an entry indicates that the soil is not suited to the intended use or is not rated)

Map symbol and soil name	Land capability	Pasture and hayland	Prime farmland	Woodland ordination symbol
Ad---------- Adrian	IVw	D-1	No	4W
Ae---------- Adrian	Vw	D-1	No	4W
Ca---------- Carlisle	IIIw	D-1	No	6W
Cb---------- Carlisle	Vw	D-1	No	6W
CcD2---------- Casco	VIe	B-1	No	4R
CeA---------- Celina	I	A-6	Yes	5A
CeB---------- Celina	IIe	A-6	Yes	5A
ChA---------- Celina---------- Strawn----------	I	A-6	Yes	5A 4A
ChB---------- Celina---------- Strawn----------	IIe	A-6	Yes	5A 4A
CrA---------- Crosby	IIw	C-1	Yes*	5D
CrB---------- Crosby	IIe	C-1	Yes*	5D
DoE---------- Donnelsville	VIe	A-4	No	2R
DpF: Donnelsville---- Rock outcrop.	VIIe	A-4	No	2R
Dr---------- Drummer	IIw	C-1	Yes*	---
EmA---------- Eldean	IIs	A-1	Yes	4A
EmB, EmB2-------- Eldean	IIe	A-1	Yes	4A

See footnote at end of table.

Interpretive Groups--Continued

Map symbol and soil name	Land capability	Pasture and hayland	Prime farmland	Woodland ordination symbol
EmC2---------- Eldean	IIIe	A-1	No	4A
EnC2---------- Eldean----------	IIIe	A-1	No	4A
Casco----------				4S
EpB2---------- Eldean----------	IIe	A-1	Yes	4A
Miamian---------				5A
EpC2---------- Eldean----------	IIIe	A-1	No	4A
Miamian---------				5A
EpC3---------- Eldean----------	IVe	A-1	No	4A
Miamian---------				5A
EpD2---------- Eldean----------	IVe	A-1	No	4R
Miamian---------				5R
EpD3---------- Eldean----------	VIe	A-1	No	4R
Miamian---------				5R
EpE2---------- Eldean----------	VIe	A-2	No	4R
Miamian---------				5R
EsE3---------- Eldean----------	VIe	A-2	No	4R
Rodman----------				4R
EuB, EuC: Eldean----------	---	---	No	---
Urban land.				
Ge, Gn---------- Genesee	IIw	A-5	Yes	5A
Ko---------- Kokomo	IIw	C-1	Yes*	4W
Lg---------- Linwood	Vw	D-1	No	2W

See footnote at end of table.

Interpretive Groups--Continued

Map symbol and soil name	Land capability	Pasture and hayland	Prime farmland	Woodland ordination symbol
Lh---------- Linwood	IIw	D-1	No	2W
Lm, Lp---------- Lippincott	IIw	C-1	Yes*	4W
Lu: Lippincott------	---	---	No	---
Urban land.				
MgB2---------- Miamian	IIe	A-1	Yes	5A
MgC2---------- Miamian	IIIe	A-1	No	5A
MgE2---------- Miamian	VIe	A-2	No	5A
MhA---------- Miamian	I	A-1	Yes	5A
MhB, MhB2-------- Miamian	IIe	A-1	Yes	5A
MhC, MhC2-------- Miamian	IIIe	A-1	No	5A
MhD2---------- Miamian	IVe	A-1	No	5R
MhE, MhE2-------- Miamian	VIe	A-2	No	5R
MkB2---------- Miamian	IIe	A-1	Yes	5A
MkC2---------- Miamian	IIIe	A-1	No	5A
MkD2---------- Miamian	IVe	A-1	No	5R
MmC3---------- Miamian	IVe	A-1	No	5A
MmD3---------- Miamian	VIe	A-1	No	5R
MmE3---------- Miamian	VIe	A-2	No	5R
MnB, MnC: Miamian---------	---	---	No	---
Urban land.				
Mo---------- Milford	IIIw	C-1	Yes*	---

See footnote at end of table.

Interpretive Groups--Continued

Map symbol and soil name	Land capability	Pasture and hayland	Prime farmland	Woodland ordination symbol
Ms---------- Millsdale	IIIw	C-2	Yes*	5W
MtA---------- Milton	IIs	F-1	Yes	4D
MtB---------- Milton	IIe	F-1	Yes	4D
MvC2---------- Milton	IIIe	F-1	No	4D
MxB: Milton----------	---	---	No	---
Urban land.				
OcA---------- Ockley	I	A-1	Yes	5A
OcB---------- Ockley	IIe	A-1	Yes	5A
Pa---------- Patton	IIw	C-1	Yes*	4W
Pg. Pits, gravel				
Ph. Pits, quarry				
RaA---------- Randolph	IIIw	C-2	Yes*	4A
RgE---------- Rodman	VIIs	B-2	No	4R
Rn---------- Ross	IIw	A-5	Yes	5A
Ro---------- Ross	I	A-5	Yes	5A
RuA---------- Rush	I	A-6	Yes	5A
ScA---------- Savona	IIw	C-1	Yes*	4A
So---------- Sloan	IIIw	C-3	Yes*	5W
StB2---------- Strawn	IIe	A-6	Yes	4A
StC2---------- Strawn	IIIe	A-6	No	4A

See footnote at end of table.

Interpretive Groups--Continued

Map symbol and soil name	Land capability	Pasture and hayland	Prime farmland	Woodland ordination symbol
StD2--- Strawn	IVe	A-6	No	4R
StE2--- Strawn	VIe	A-2	No	4R
SuA--- Strawn---	IIw	C-1	Yes*	4A
Crosby---				5D
SuB--- Strawn---	IIe	A-6	Yes*	4A
Crosby---				5D
ThA--- Thackery	I	A-6	Yes	5A
Tr--- Tremont	I	A-5	Yes	5A
Ts--- Tremont	IIw	A-5	Yes	5A
Ud. Udorthents				
Ur. Urban land				
Wc--- Wallkill	IIIw	D-1	No	2W
WeA--- Warsaw	IIs	A-1	Yes	---
WpA--- Waupecan	I	A-1	Yes	---
WrA--- Waynetown	IIw	C-1	Yes*	5A
Wt--- Westland	IIw	C-1	Yes*	5W

* Where drained.

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