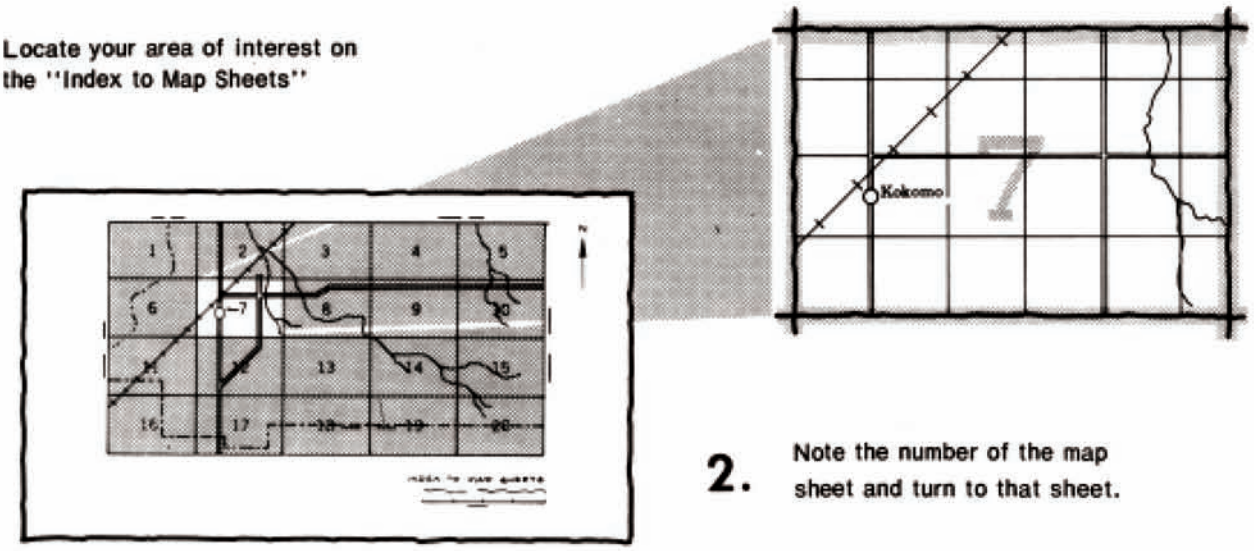
Soil Survey of OGLE COUNTY, ILLINOIS

United States Department of Agriculture
Soil Conservation Service

HOW TO USE

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



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

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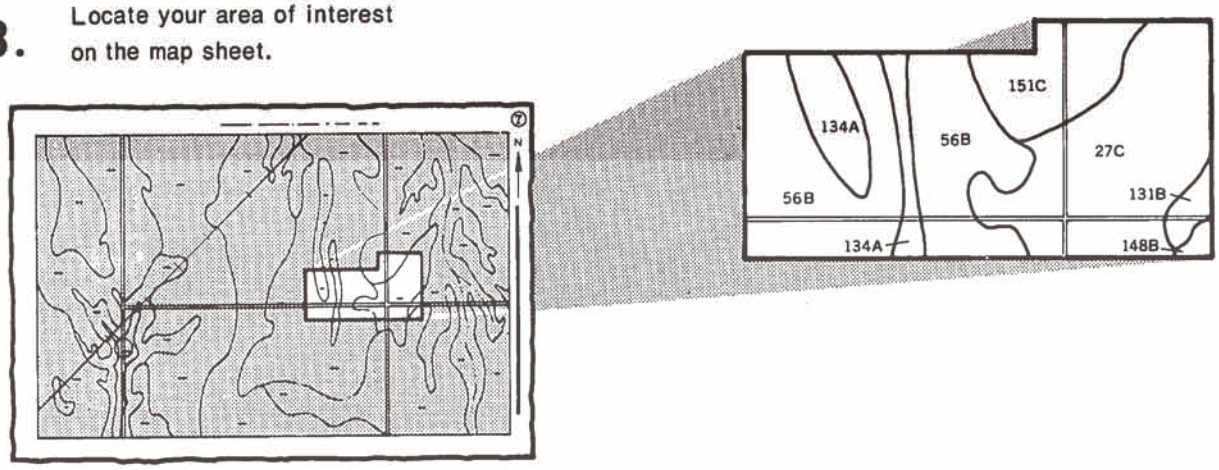

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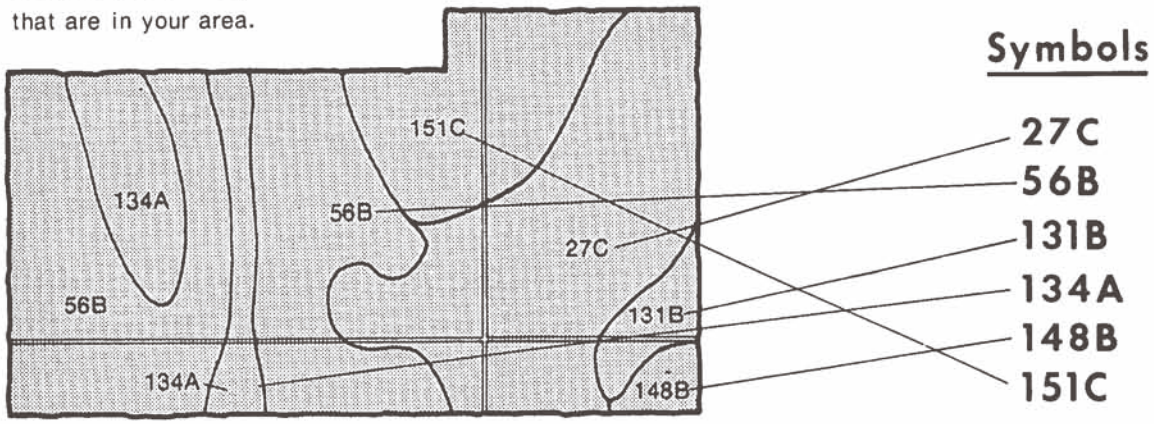
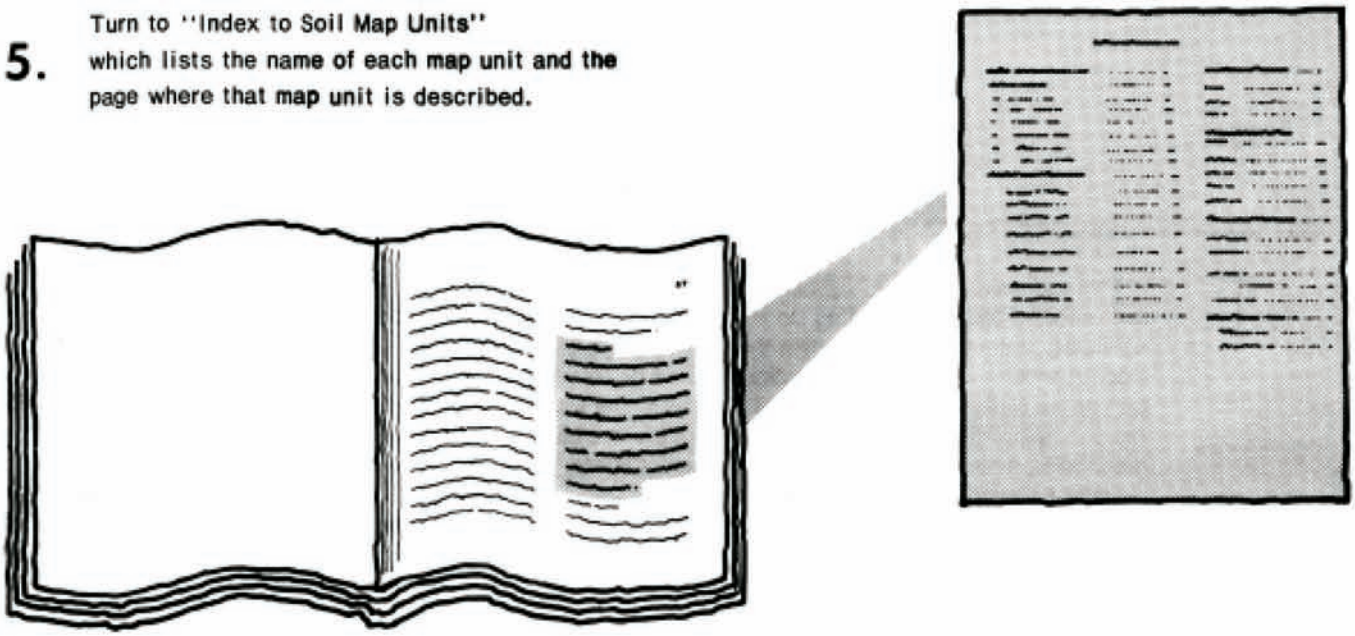
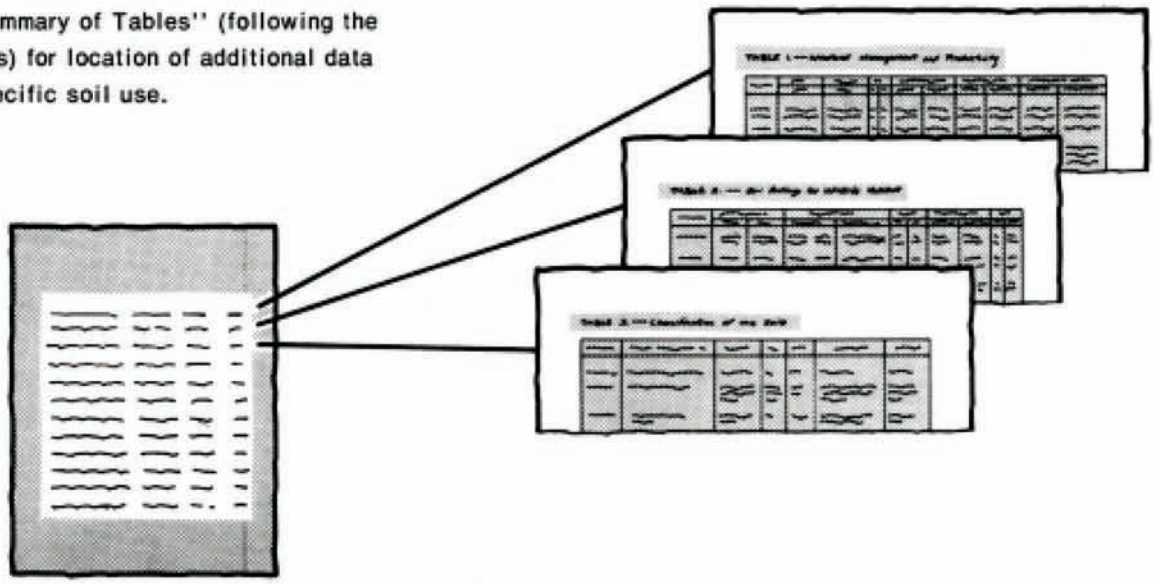


THIS SOIL SURVEY

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



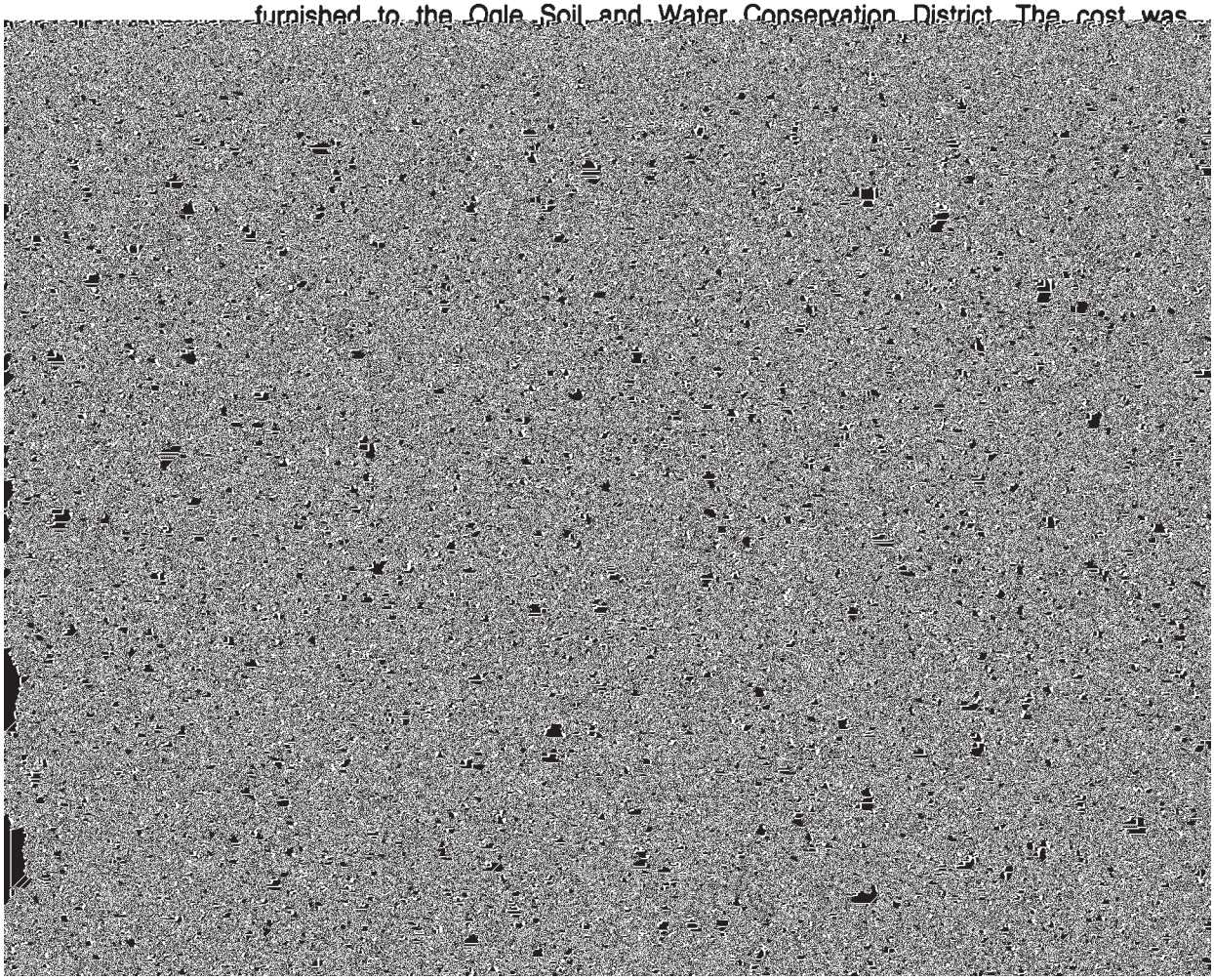
6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



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

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

Major fieldwork for this soil survey was completed in the period 1972 through 1977. Soil names and descriptions were approved in 1977. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1977. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. This soil survey is Illinois Agricultural Experiment Station Report No. 113. It is part of the technical assistance furnished to the Ogle Soil and Water Conservation District. The cost was



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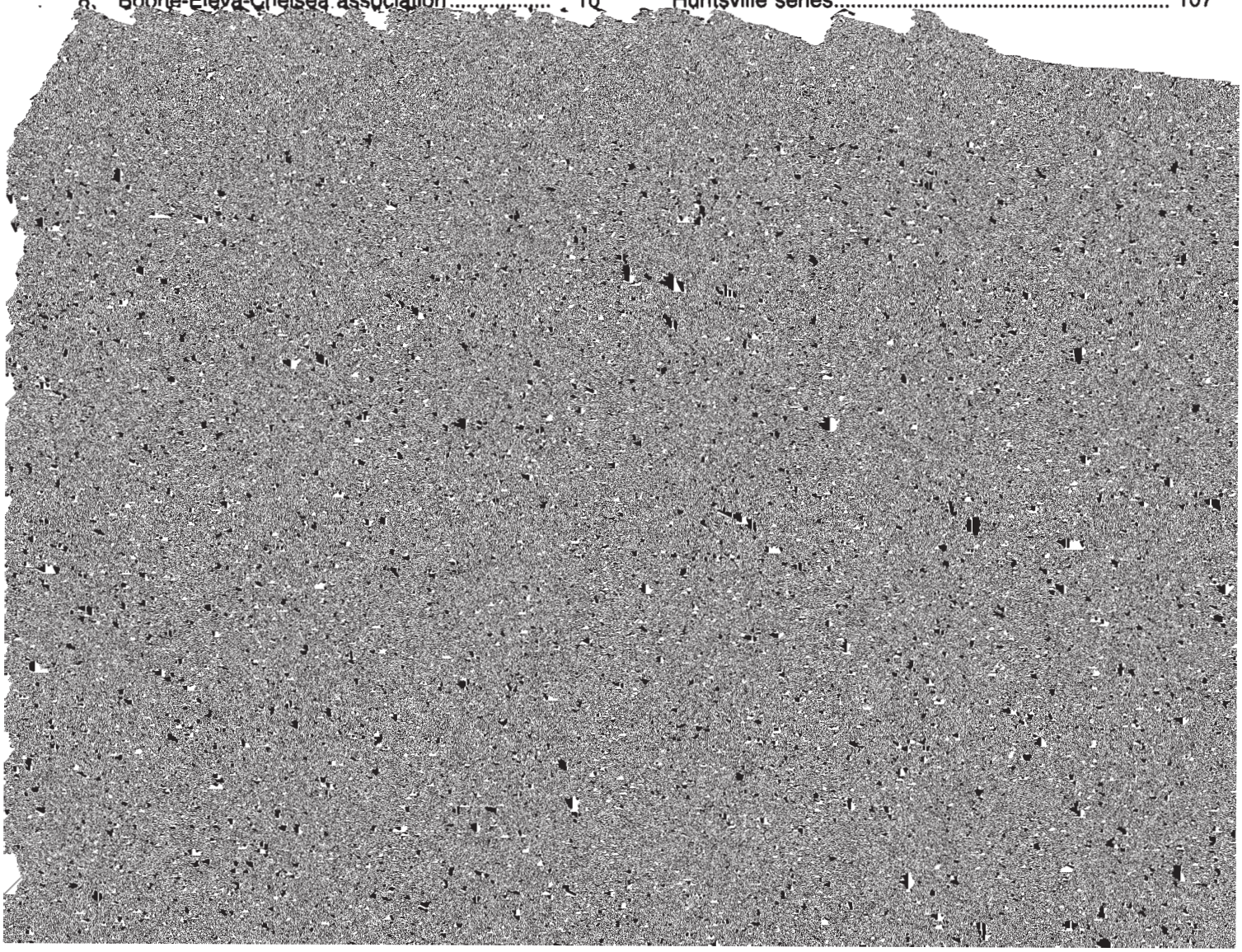

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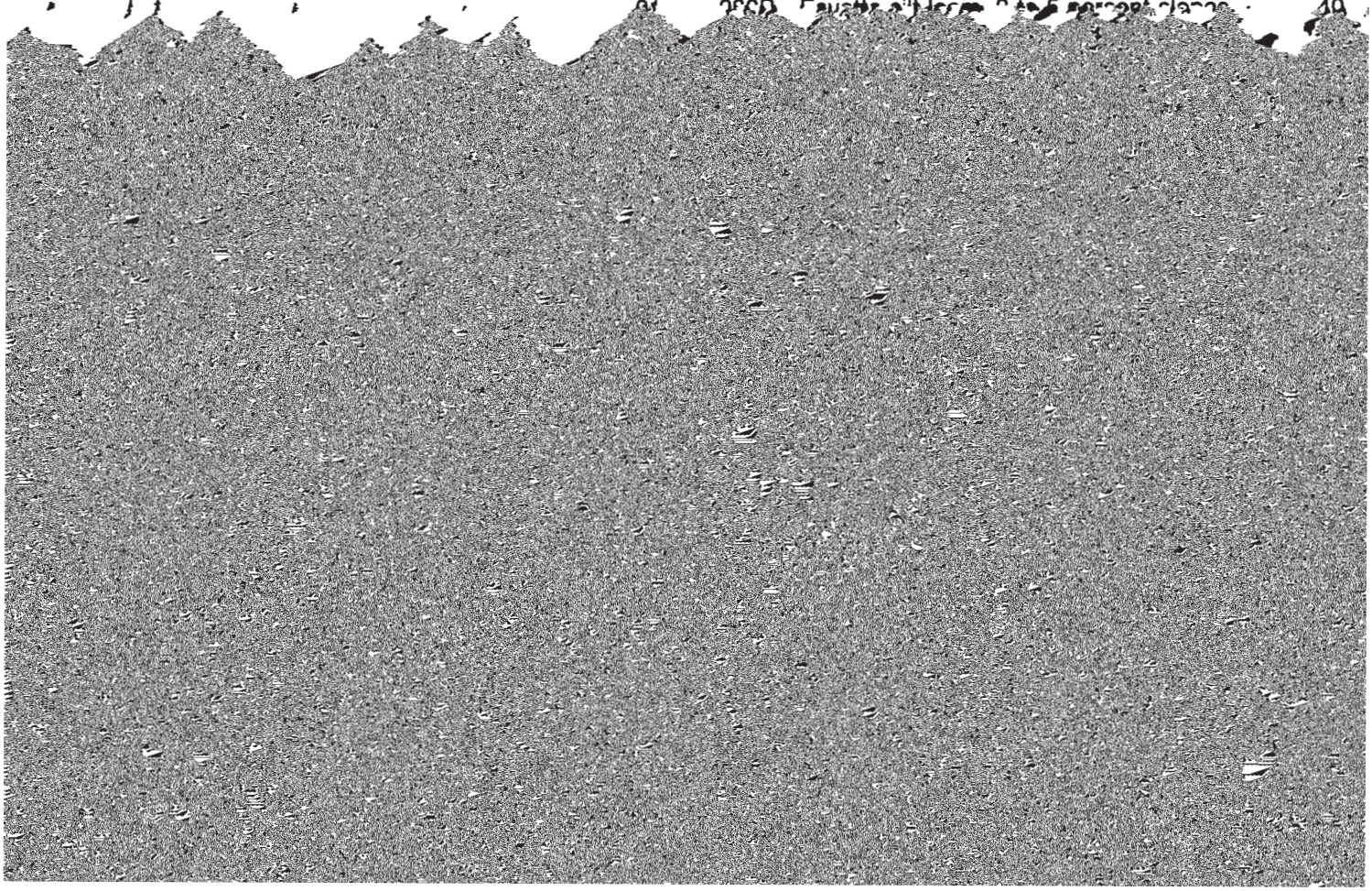

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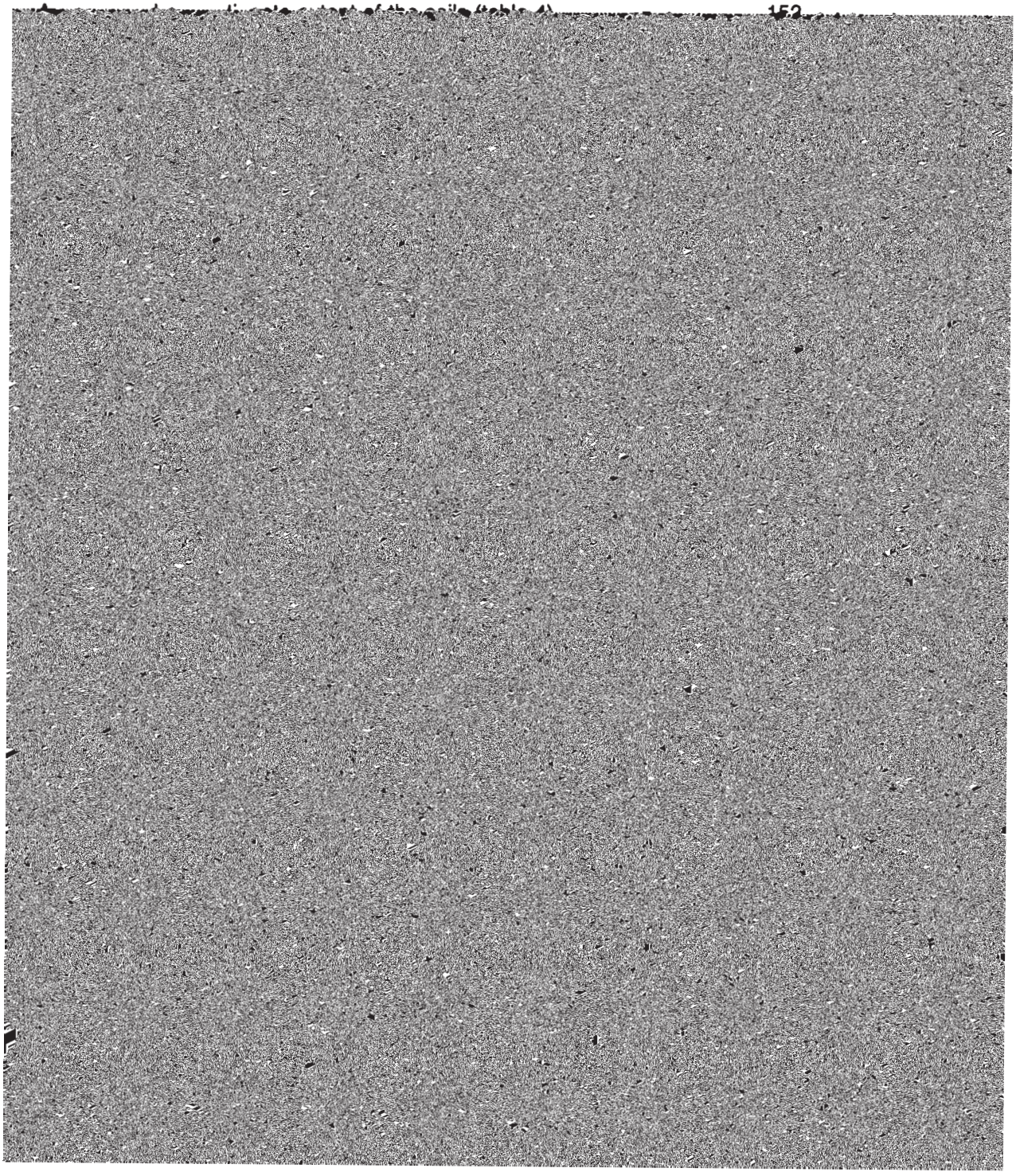

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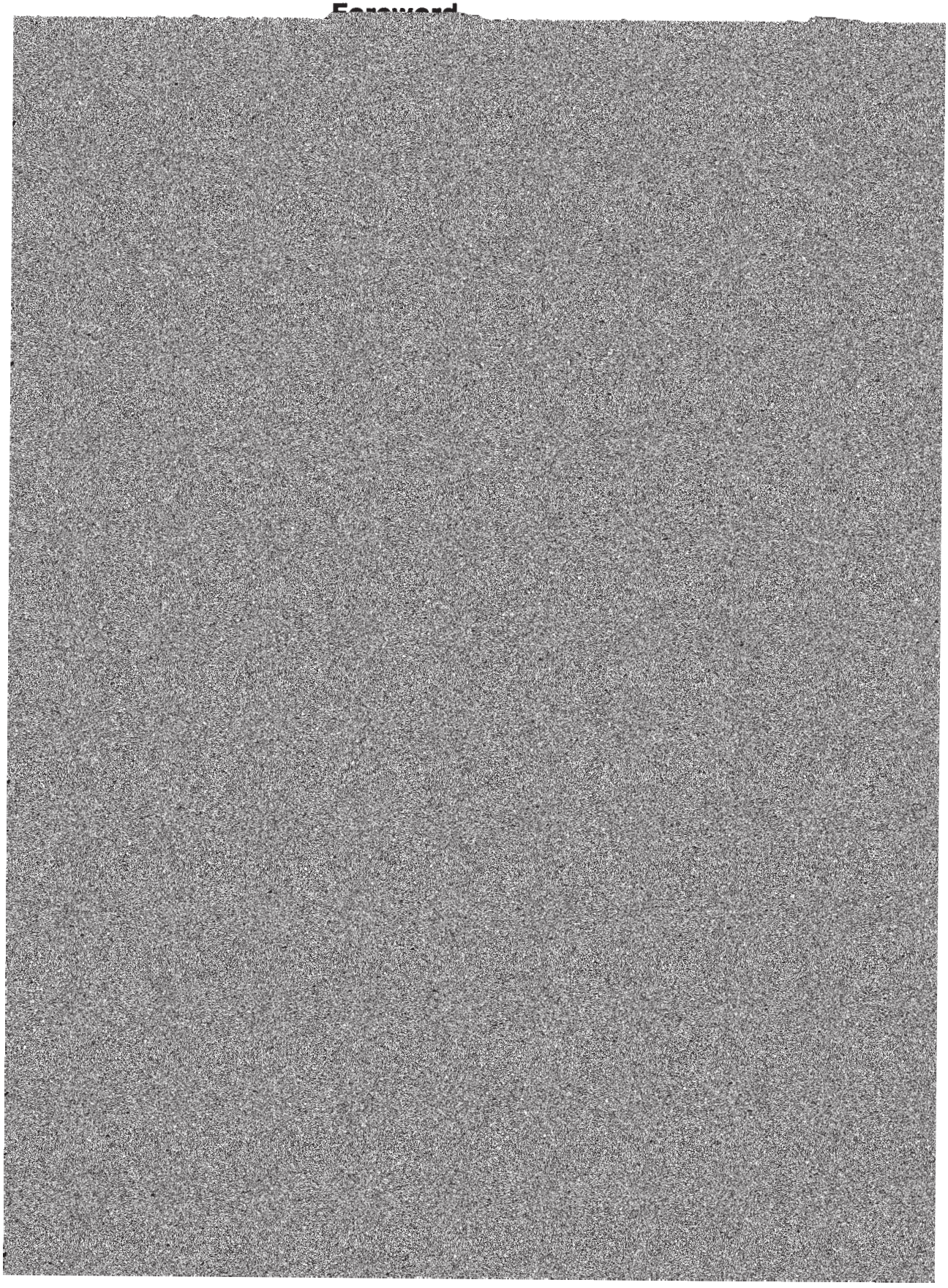
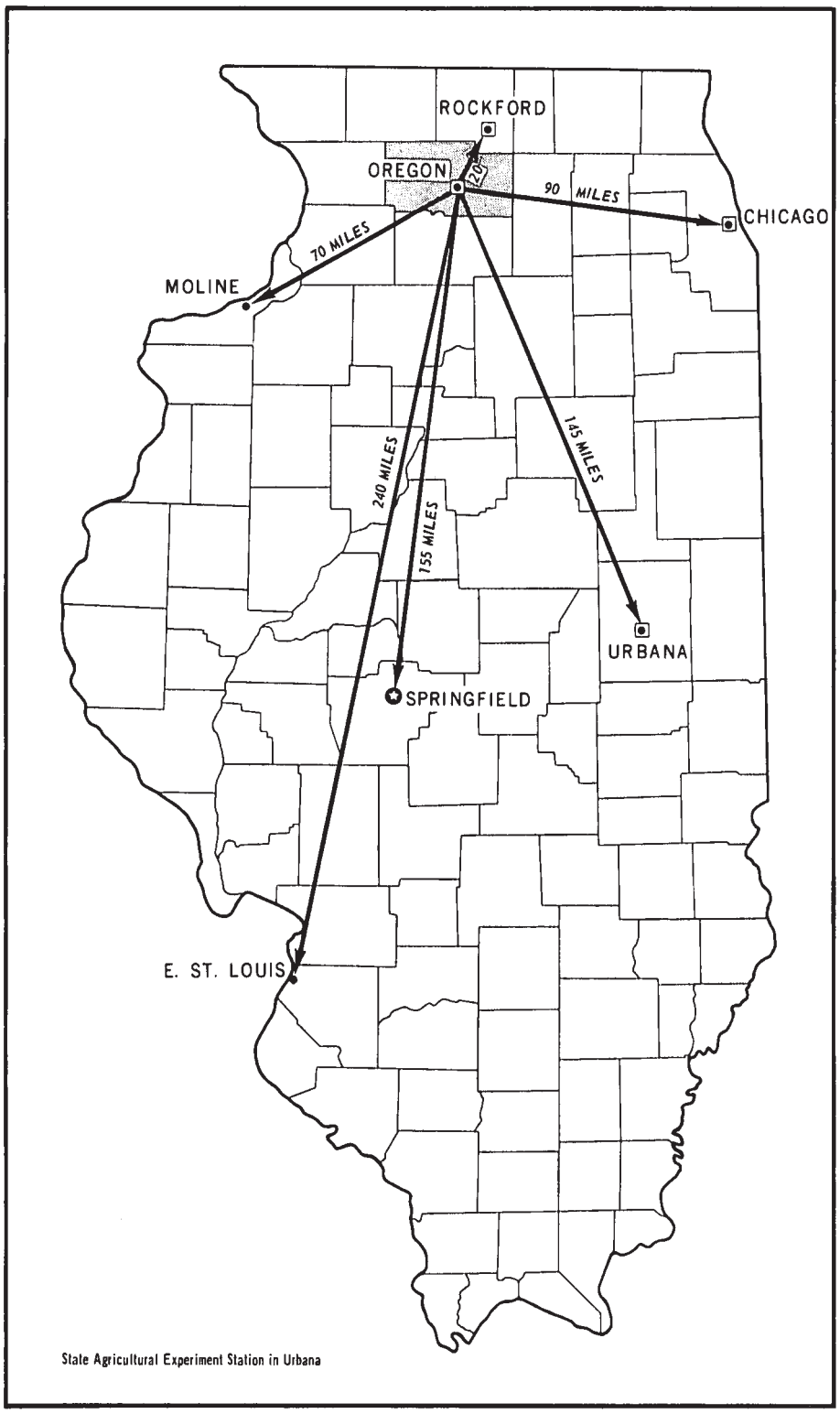




Location of Ogle County in Illinois.

SOIL SURVEY OF OGLE COUNTY, ILLINOIS

By Lawrence L. Acker, Mack S. Hodges, George T. Keller and Richard Rehner,
Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service,
in cooperation with Illinois Agricultural Experiment Station

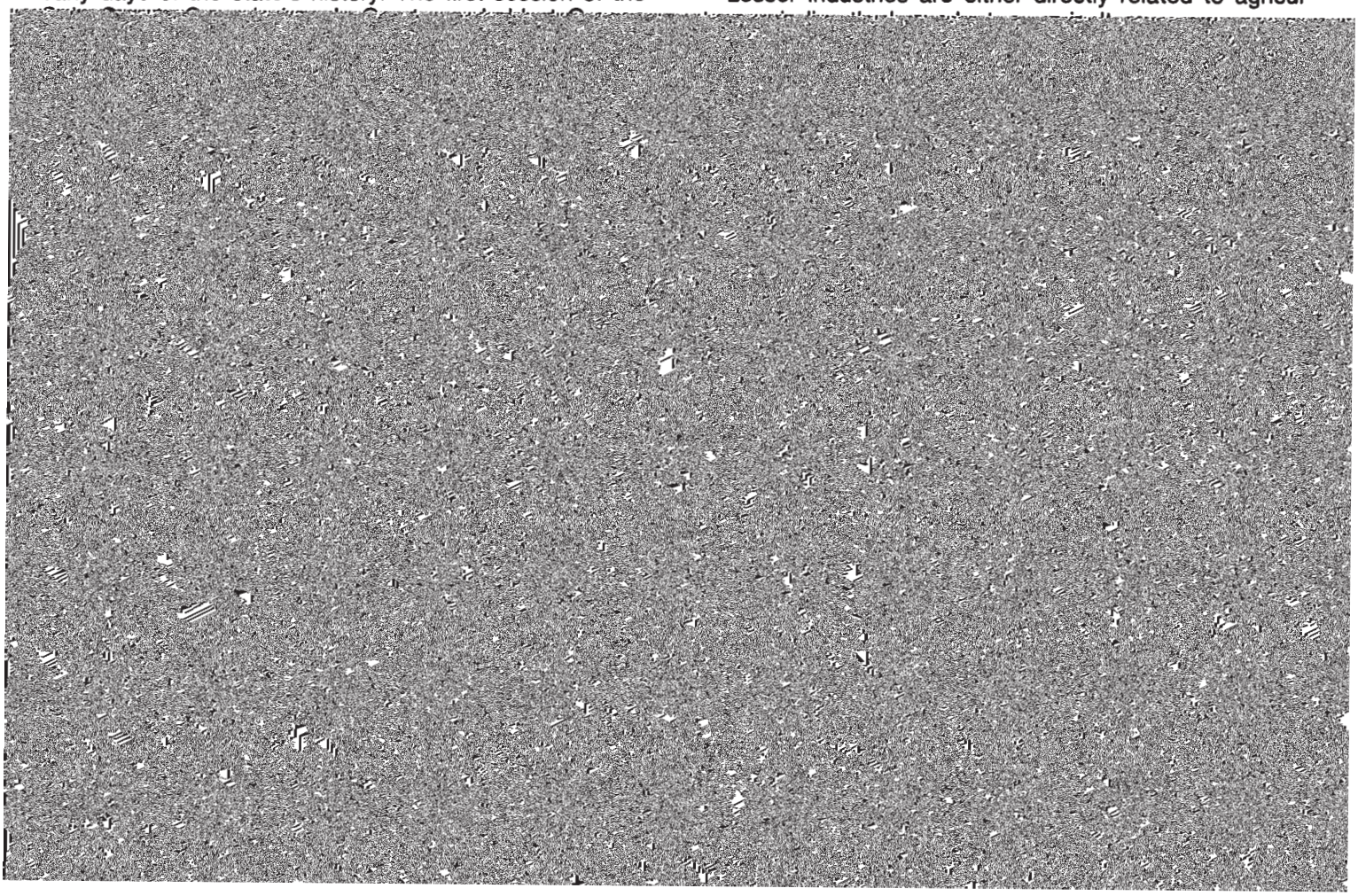
General nature of the county

Ogle County was established January 16, 1836, from a part of Jo Daviess County. It was once a part of the Northwest Territory. The name Ogle was suggested by Thomas Ford in memory of Captain Joseph Ogle, who distinguished himself for his courage and coolness in the early days of the state's history. The first session of the

Farming and industry

Agriculture is a major factor in the economy of Ogle County. Other important industries are printing and the canning of vegetable crops. Meat packing, production of electricity, recreation, lumber, textile manufacturing, and limestone and sand production are also important.

Lesser industries are either directly related to agricul-



general, use labor more efficiently and are designed to handle livestock wastes with a minimum of pollution.

Parks and recreation

Although Ogle County is predominately agricultural, the variety of natural resources makes it ideal for park and recreational pursuits. The Rock River, running the entire breadth of the county, and the three state parks, Lowden, White Pines, Castle Rock, make this area particularly attractive to people outside of this area. In addition to state parks, there are numerous church camps and private campgrounds accessible to the public, all of which bring people into the area. Approximately 30 public recreational enterprises in Ogle County provide the following types of recreation: swimming, horseback riding, golfing, camping, fishing, dude ranching, rural zoo (domestic and wild animals), canoeing and boating.

Climate

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

Ogle County is cold in winter and is quite hot, with occasional cool spells, in summer. Precipitation during the winter frequently is in the form of snowstorms. When warm moist air moves in from the south during the warm months, it is chiefly showers, often heavy. Total annual rainfall is normally adequate for corn, soybeans, and small grains.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Rochelle in the period 1951 to 1975. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 23 degrees F, and the average daily minimum temperature is 14 degrees. The lowest temperature on record, which occurred at Rochelle on January 23, 1963, is -24 degrees. In summer the average temperature is 71 degrees, and the average daily maximum temperature is 82 degrees. The highest recorded temperature, which occurred on July 1, 1956, is 100 degrees.

Growing degree days are shown in table 1. They are

Average seasonal snowfall is 33 inches. The greatest snow depth at any one time during the period of record was 13 inches. On an average of 16 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the west-northwest. Average windspeed is highest, 11 miles per hour, in spring.

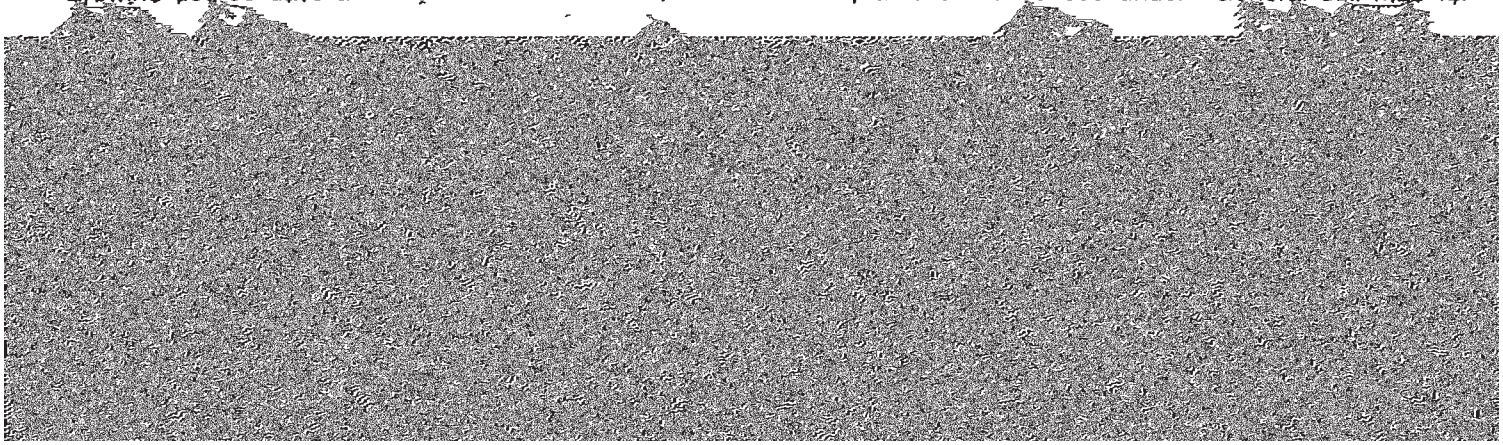
Tornadoes and severe thunderstorms strike occasionally. These storms are local and of short duration. They result in sparse damage in narrow belts. Hailstorms occur at times during the warmer part of the year in irregular patterns and in relatively small areas.

How this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map for



on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

General soil map for broad land use planning

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

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

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

Broad land-use considerations

The soils in Ogle County vary widely in their suitability for major land uses.

Most of the acreage in the county is used for cultivated crops, dominantly corn and soybeans. This cropland is scattered throughout the county, but it is concentrated largely in associations 1, 2, 3, 4, 5, 7, and 10. Associations 1, 2, 3, 4, 5, 6, and 7 are on nearly level to strongly sloping uplands; the hazard of erosion is the main limitation for crops. Tama, Plano, and Catlin soils are the most extensive soils. Associations 2 and 10 are flooded occasionally, principally in winter and early in

Martinsville soils have the best suitability for urban uses. These soils are mainly in associations 8 and 9. In other associations low strength, frost action, wetness, and steep slopes are the principle soil limitations. Soils on flood plains, such as those in association 10, are poorly suited to urban development because of flooding. Sites that are suitable for houses or small commercial buildings, however, are generally available in many areas.

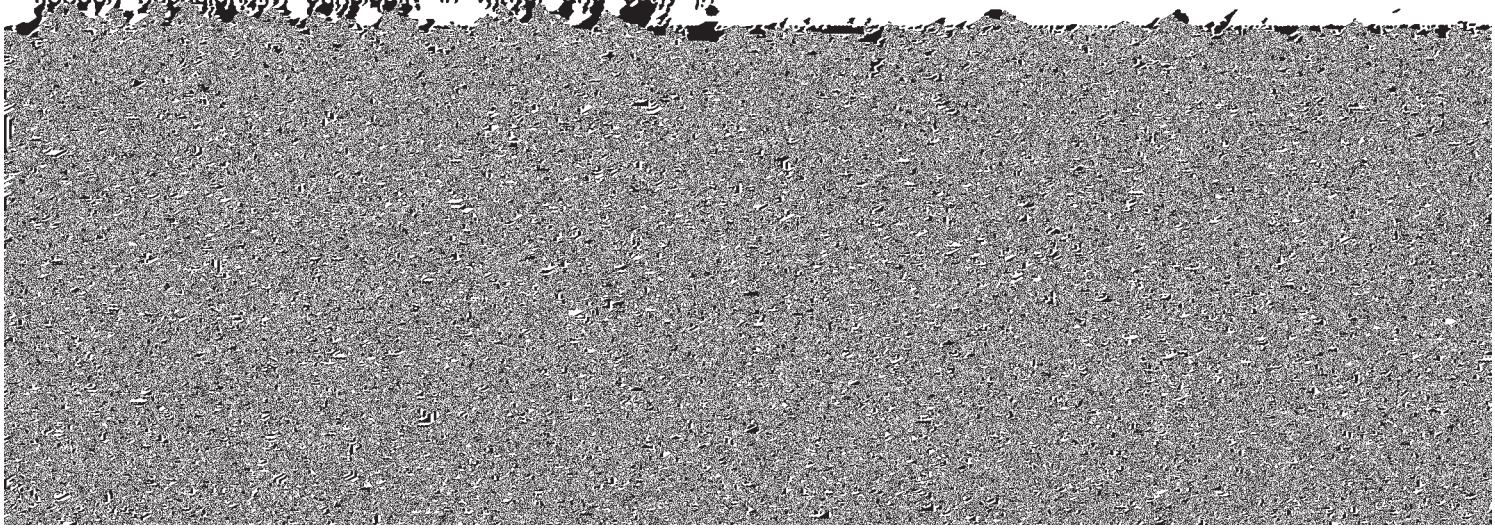
Suitability for recreation ranges from good to poor, depending on the intensity of expected use. Association 7 is well suited for intensive recreational development. Associations 2 and 10 are poorly suited because of flooding. The hilly to steep slopes within associations 8 and 9 limit suitability of the soils for intensive recreational development, such as playgrounds and camp areas. All of these associations, however, are suitable for extensive recreational uses, such as hiking or horseback riding. Small areas suitable for intensive recreational uses are available in associations that are generally poorly suited to recreational development.

Suitability for wildlife habitat is good throughout the county. All associations, except 8 and 10, are well suited to habitat for openland wildlife. The suitability for woodland wildlife habitat is good in associations 6, 7, 8, and 9. The soils on flood plains and outwash plains in associations 2 and 10 are well suited for habitat for wetland wildlife. The Comfrey soils are especially suitable for shallow water areas for waterfowl.

Descriptions and potentials of soil associations

Areas dominated by silty and loamy soils that formed in loess, glacial till, and outwash on uplands and in upland depressions

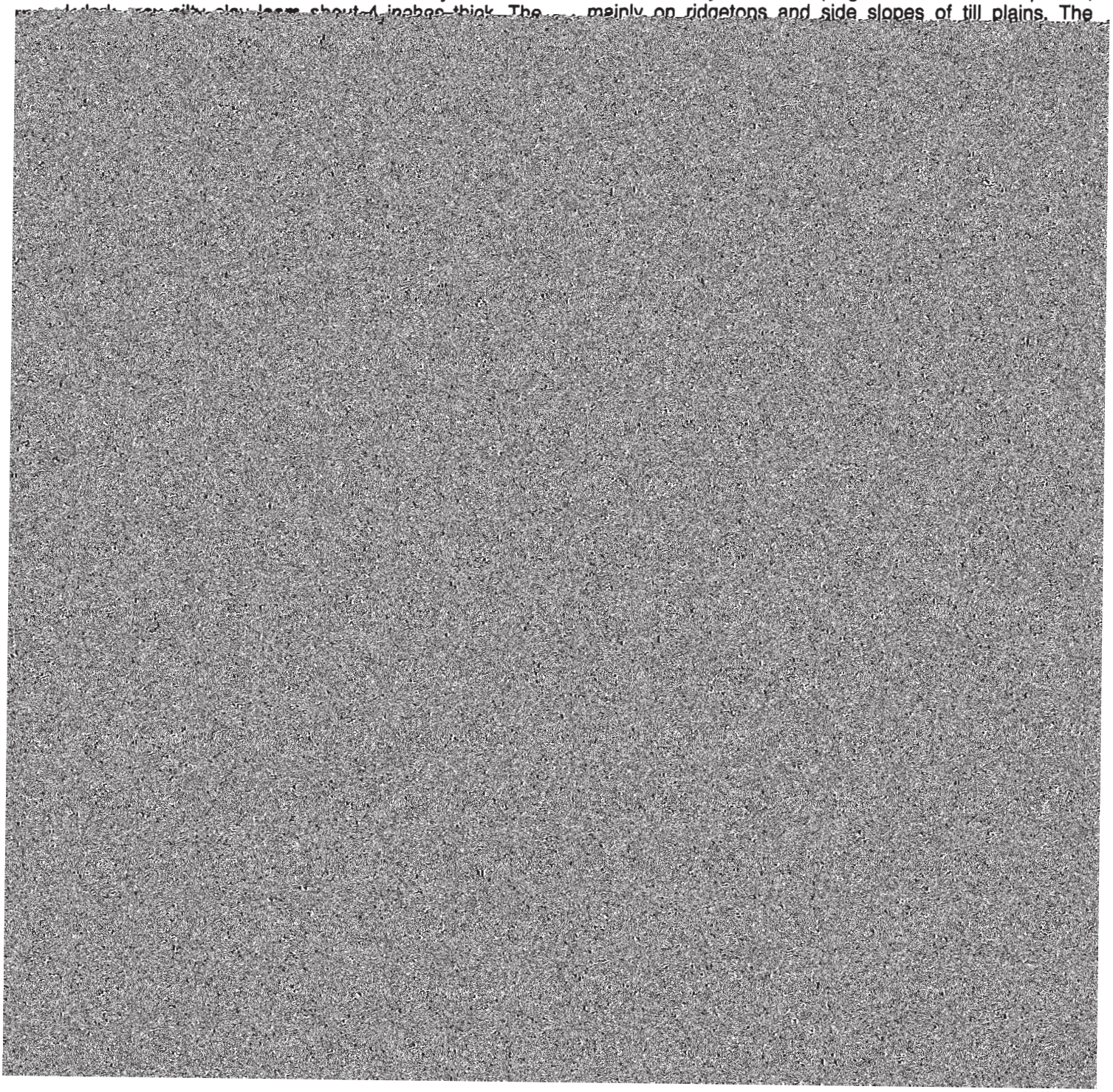
These soils are dominantly nearly level to strongly sloping, but some soils on outwash plains are level. The most extensive problem is soil erosion. Drainage is also a concern on some soils.

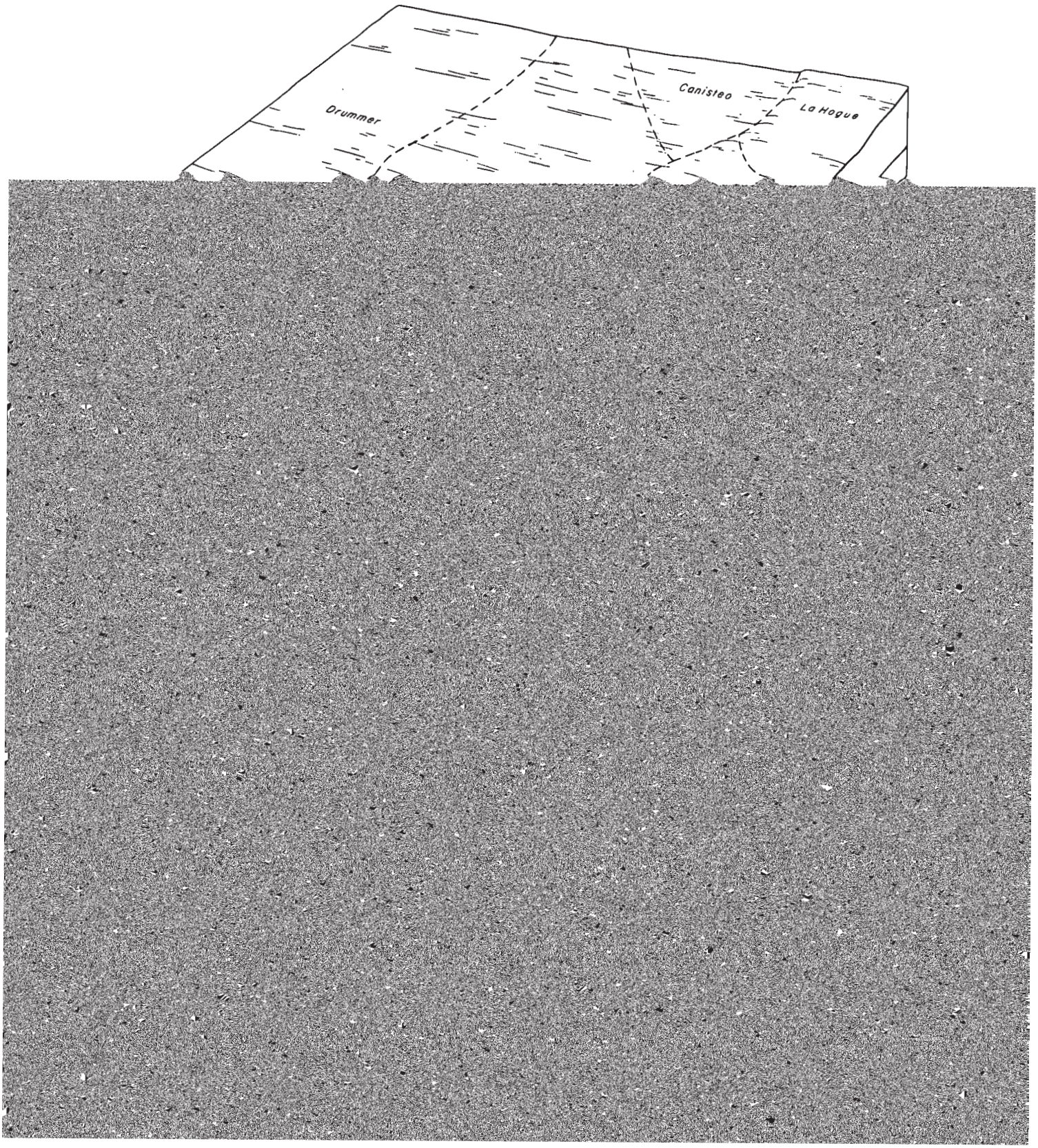


thick. The upper part is brown silty clay loam, the middle part is grayish brown silty clay loam, and the lower part is yellowish brown loam. The substratum, to a depth of 60 inches, is brown, calcareous loam.

Drummer soils are poorly drained. These nearly level soils are mainly in low lying areas and depressions on till and outwash plains. The surface layer is black silty clay loam about 8 inches thick. The subsurface layer is black [illegible] silty clay loam about 4 inches thick. The

on uplands. The moderately well drained, nearly level to sloping Catlin soils are on uplands on convex side slopes. They are mapped with Saybrook soils. The somewhat poorly drained, nearly level to gently sloping Elburn soils are on stream terraces and gentle side slopes on uplands. The well drained, nearly level to sloping Jasper soils are on outwash plains. The well drained, nearly level to sloping Parr soils are on uplands, mainly on ridgetops and side slopes of till plains. The



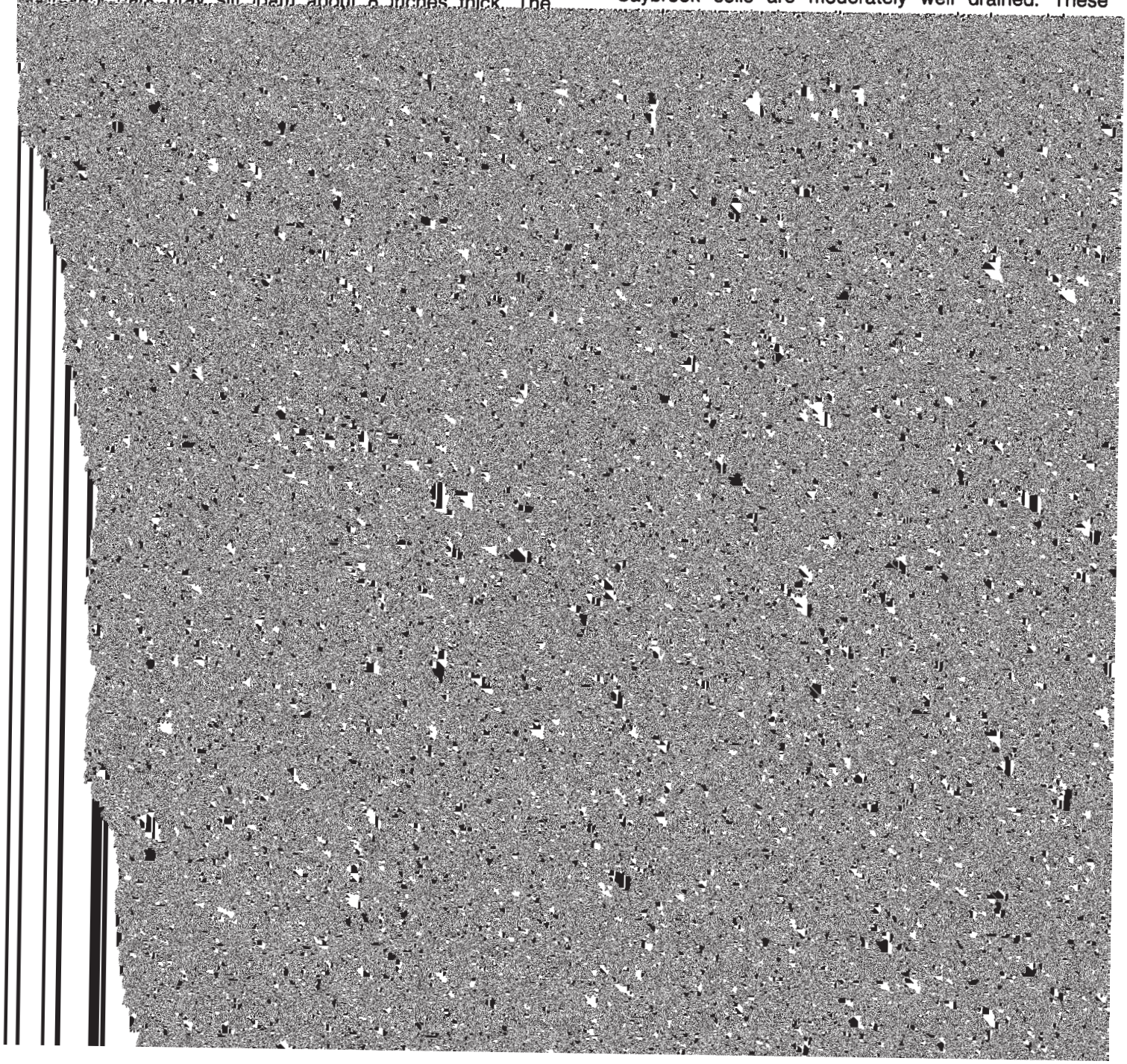

Drummer
Canistea
La Hogue

the county. It is about 18 percent Plano soils, 17 percent Catlin soils, 6 percent Saybrook soils, and 59 percent soils of minor extent (fig. 3).

Plano soils are moderately well drained. These nearly level to sloping soils are on uplands, mainly on broad ridgetops. The Plano soils typically have a surface layer of very dark gray silt loam about 8 inches thick. The

and dark brown silty clay loam; the middle part is yellowish brown, mottled silty clay loam; and the lower part is dark yellowish brown clay loam. The substratum, to a depth of 60 inches, is yellowish brown, calcareous loam till.

Saybrook soils are moderately well drained. These



to sloping Ogle soils are on ridgetops and side slopes on uplands. The well drained, nearly level to sloping Jasper soils are on outwash plains. The well drained, gently sloping to sloping Palsgrove soils are on broad ridgetops and convex side slopes on uplands. The well drained, nearly level to sloping Tama soils are on convex ridgetops, side slopes, and high stream terraces on uplands. The poorly drained, nearly level Drummer soils are in low lying areas and depressions on till and outwash plains. The well drained, nearly level to sloping Parr soils are on uplands. These soils are on ridgetops and side slopes on till plains.

The soils in this association are primarily used for corn, soybeans, small grain, and hay and pasture. Beef cattle and hogs are the main livestock enterprises. Erosion is the main concern of management.

These soils are only moderately suited to dwellings because they shrink and swell. Plano soils are well suited to septic tank absorption fields, but Catlin soils are poorly suited because they are wet. Saybrook soils are moderately suited to septic tank absorption fields because of wetness and permeability.

4. Jasper-Parr-Varna association

Nearly level to sloping, moderately well drained and well drained soils that formed in loamy material or calcareous till

This soil association consists of soils on convex slopes, ridgetops, and side slopes. It makes up about 5 percent of the county. It is about 32 percent Jasper soils, 21 percent Parr soils, 5 percent Varna soils, and 42 brown silty clay loam about 5 inches thick. The subsoil is about 38 inches thick. The upper part is dark brown silty clay loam, the middle part is brown silty clay, and the lower part is brown clay loam. The substratum, to a depth of 60 inches, is pale brown, calcareous clay loam till.

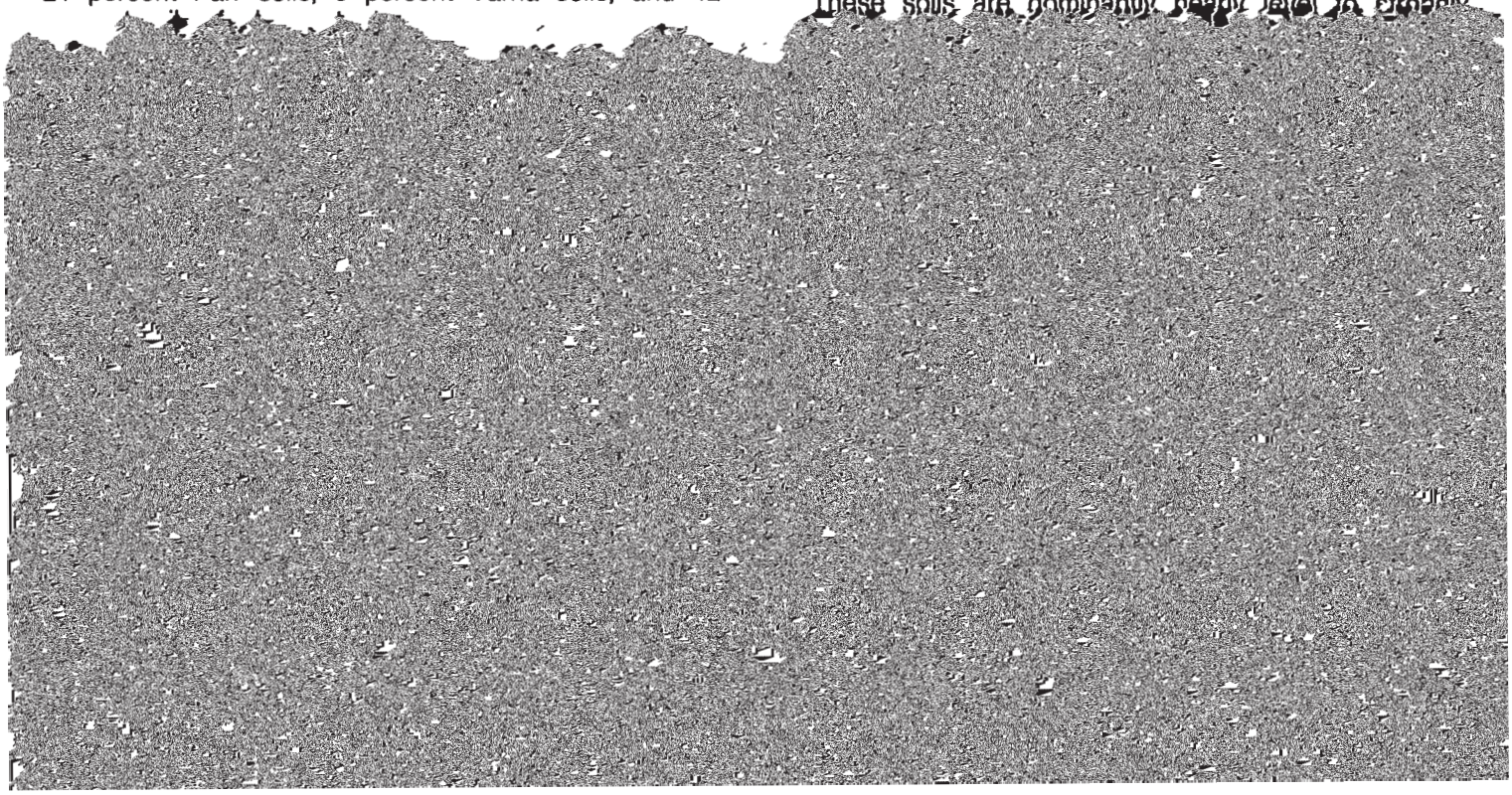
Of minor extent are Odell, Selma, Drummer, La Hogue, and Dickinson soils. The somewhat poorly drained, nearly level Odell soils are on till plains on uplands. The poorly drained, nearly level Selma soils are along streams and drainageways on outwash plains. The poorly drained, nearly level Drummer soils are in low lying areas on outwash plains and in depressions on till and outwash plains. The somewhat poorly drained, nearly level La Hogue soils are on stream terraces and outwash plains. The well drained, gently sloping to sloping Dickinson soils are on convex side slopes, on stream benches, and in outwash areas on uplands.

The soils in this association are used primarily for corn, soybeans, small grain, and hay. Hogs and beef cattle are the main livestock enterprises. Erosion and drainage are the main concerns of management.

The soils of this association are well suited to moderately suited to dwellings. Parr and Varna soils are limited because they shrink and swell. These soils are moderately suited to poorly suited to septic tank absorption fields because of the permeability, and Varna soils are also limited by wetness.

Areas dominated by silty soils that formed in loess or in loess over an older buried soil on uplands

These soils are dominantly nearly level to strongly



slopes. Typically, the Ogle soils have a surface layer of very dark gray silt loam about 7 inches thick. The subsurface is very dark grayish brown and dark brown silt loam about 4 inches thick. The subsoil is about 65 inches thick. The upper part is dark brown and dark yellowish brown silty clay loam; the middle part is yellowish brown silty clay loam and silt loam; and the lower part is reddish brown and yellowish red, friable loam, and firm clay loam.

Muscatine soils are somewhat poorly drained. These nearly level soils are on uplands, mainly on divides and along drainageways. The Muscatine soils typically have a surface layer of black silt loam about 7 inches thick. The subsurface layer is black silt loam about 9 inches thick. The subsoil is silty clay loam about 34 inches thick. The upper part is very dark grayish brown, the middle part is mottled and dark grayish brown, and the lower part is mottled grayish brown. The substratum, to a depth of 60 inches, is mottled yellowish brown and light olive gray silt loam.

Of minor extent are Catlin, Radford, Assumption, Sable, and Lawson soils. Catlin soils are moderately well drained and nearly level to sloping. These soils are on convex side slopes on uplands. The somewhat poorly drained, nearly level Radford soils are on foot slopes and bottom lands along smaller, intermittent streams. The moderately well drained Assumption soils are in sloping areas. The poorly drained, level and nearly level Sable soils are in drainageways. Lawson soils are somewhat poorly drained and nearly level. These soils are on first and second bottoms near major streams and in old oxbows on outwash plains.

The soils in this association are primarily used for corn, soybeans, small grain, and hay. Dairy cattle is the main livestock enterprise. Erosion is the main concern of management.

These soils are moderately suited to dwellings because they shrink and swell. Muscatine soils are also limited for this use by wetness. Tama and Ogle soils are well suited to septic tank absorption fields, but Muscatine soils are poorly suited because they are wet.

6. Pecatonica-Flagg-Westville association

Gently sloping to strongly sloping, well drained soils that formed in loess over an older buried soil

This soil association consists of soils on ridgetops and covex side slopes. It makes up about 3 percent of the county. It is about 24 percent Pecatonica soils, 22 percent Flagg soils, 8 percent Westville soils, and 46 percent soils of minor extent (fig. 5).

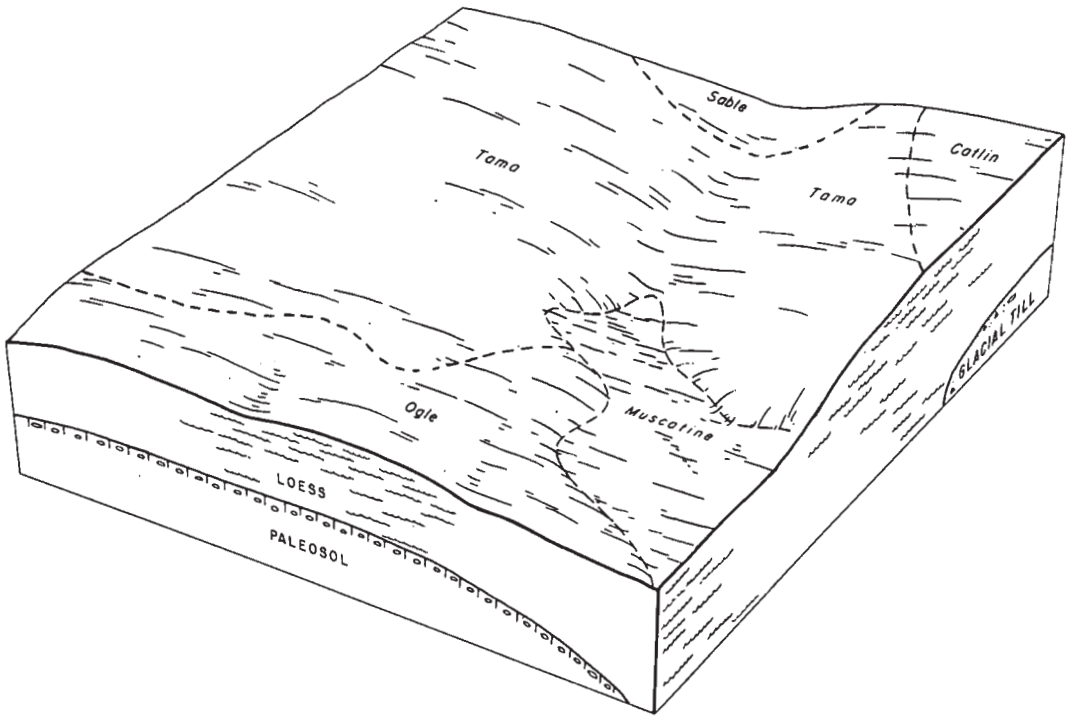


Figure 4.—Relationship of soils to topography and underlying material in the Tama-Ogle-Muscatine association.

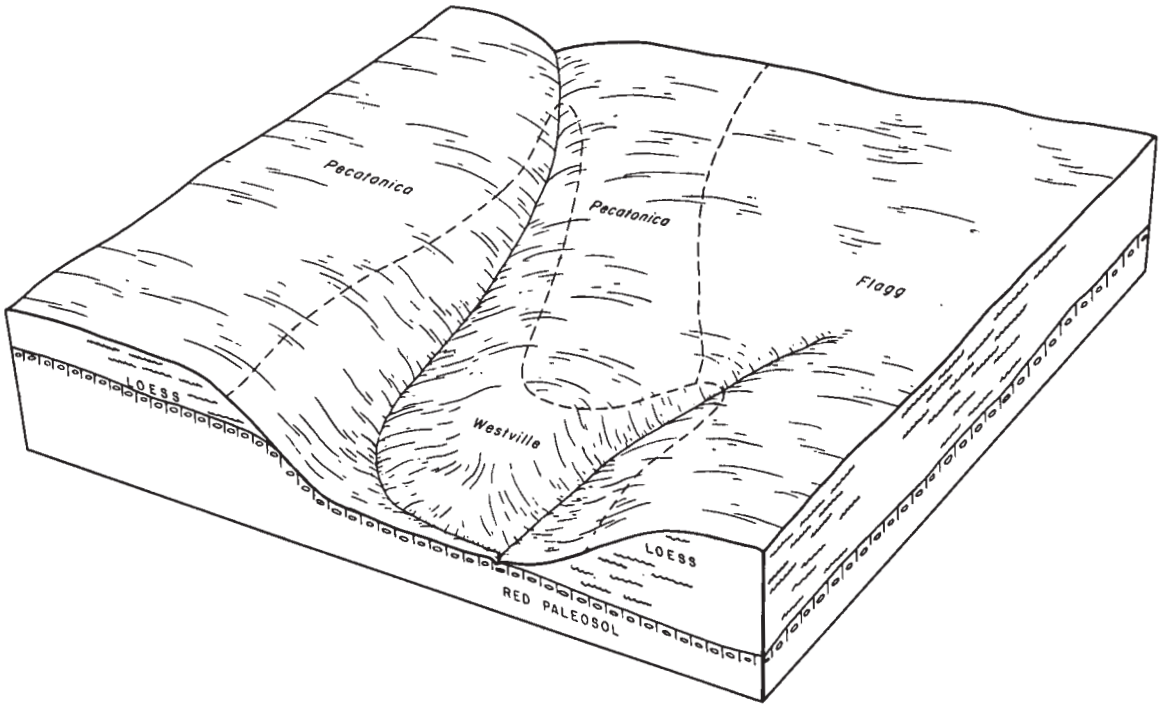
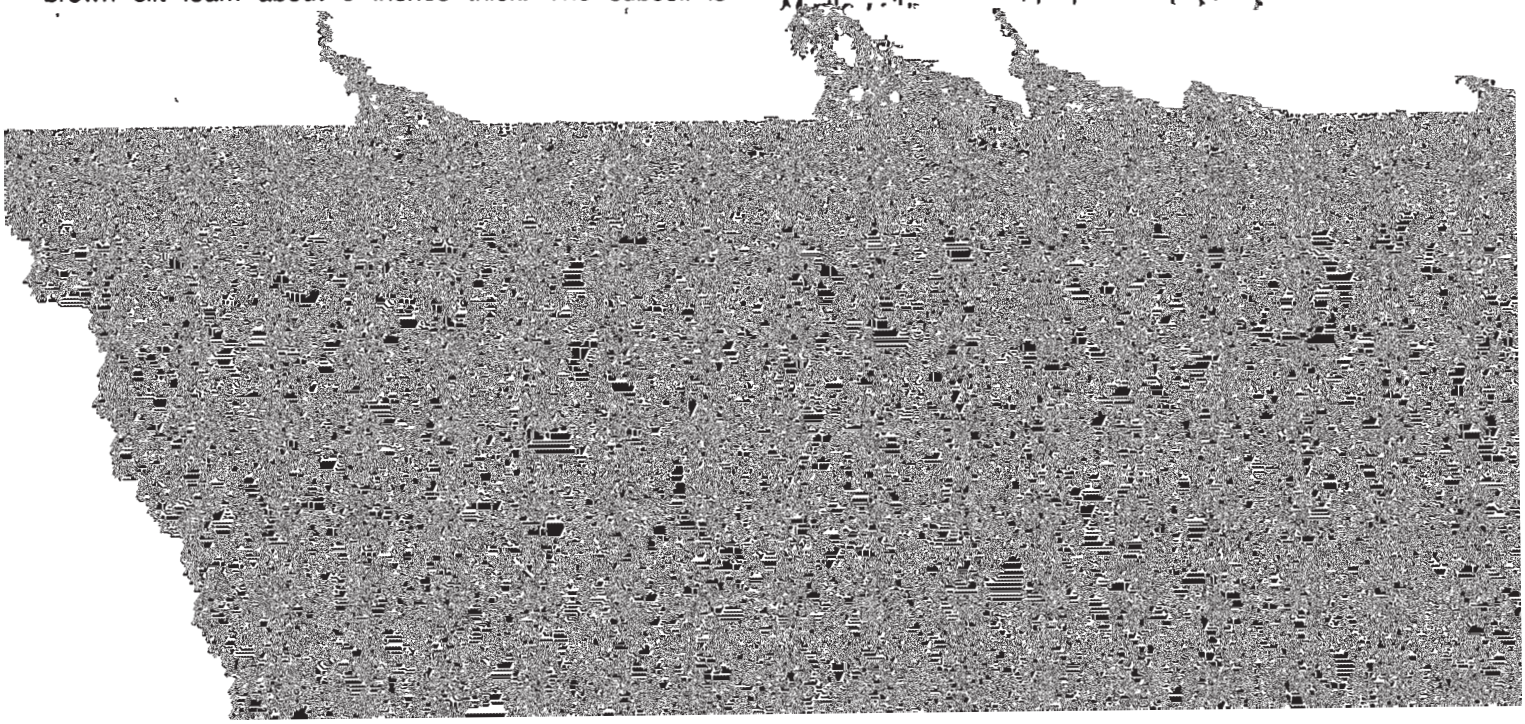


Figure 5.—Relationship of soils to topography and underlying material in the Pecatonica-Flagg-Westville association.

Pecatonica soils are well drained. These gently sloping to strongly sloping soils are on uplands, mainly on ridgetops and side slopes. The Pecatonica soils typically have a surface layer of dark grayish brown silt loam about 6 inches thick. The subsurface layer is very dark yellowish brown silt loam about 5 inches thick. The subsoil is inches, is mixed yellowish red and strong brown loam and sandy loam.

Of minor extent in this association are Kidder, Myrtle, Martinsville, Fayette, and Miami soils. The well drained, gently sloping to strongly sloping Kidder soils are on side slopes on uplands. The well drained, gently sloping



terraces. It makes up about 9 percent of the county. It is

and in old oxbows on outwash plains. The well drained, nearly level to moderately steep Whalan soils are on

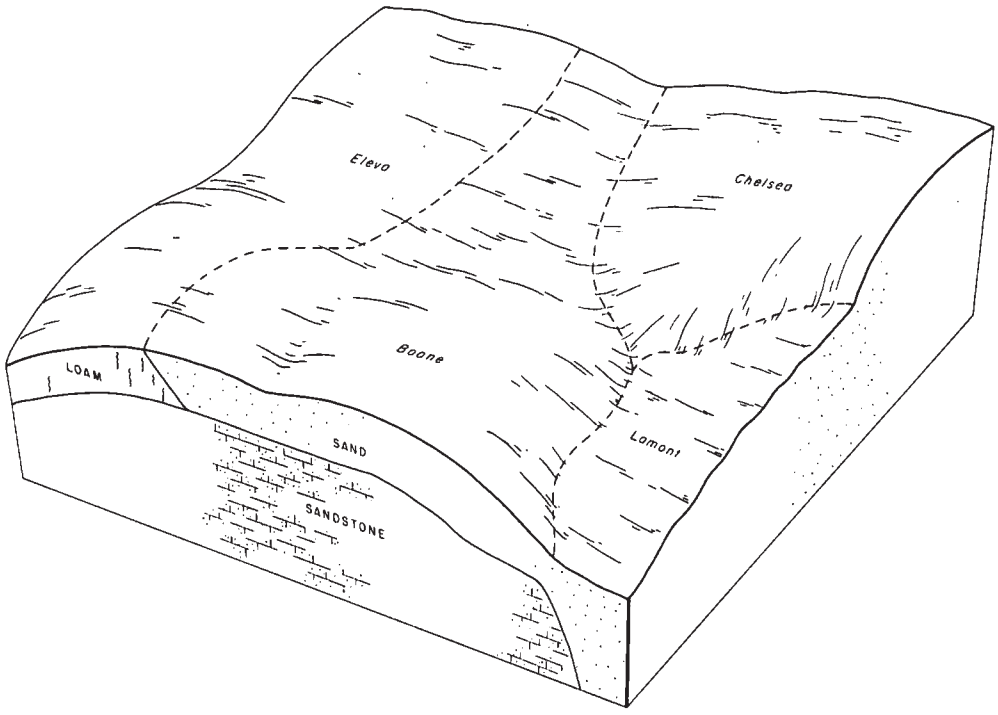
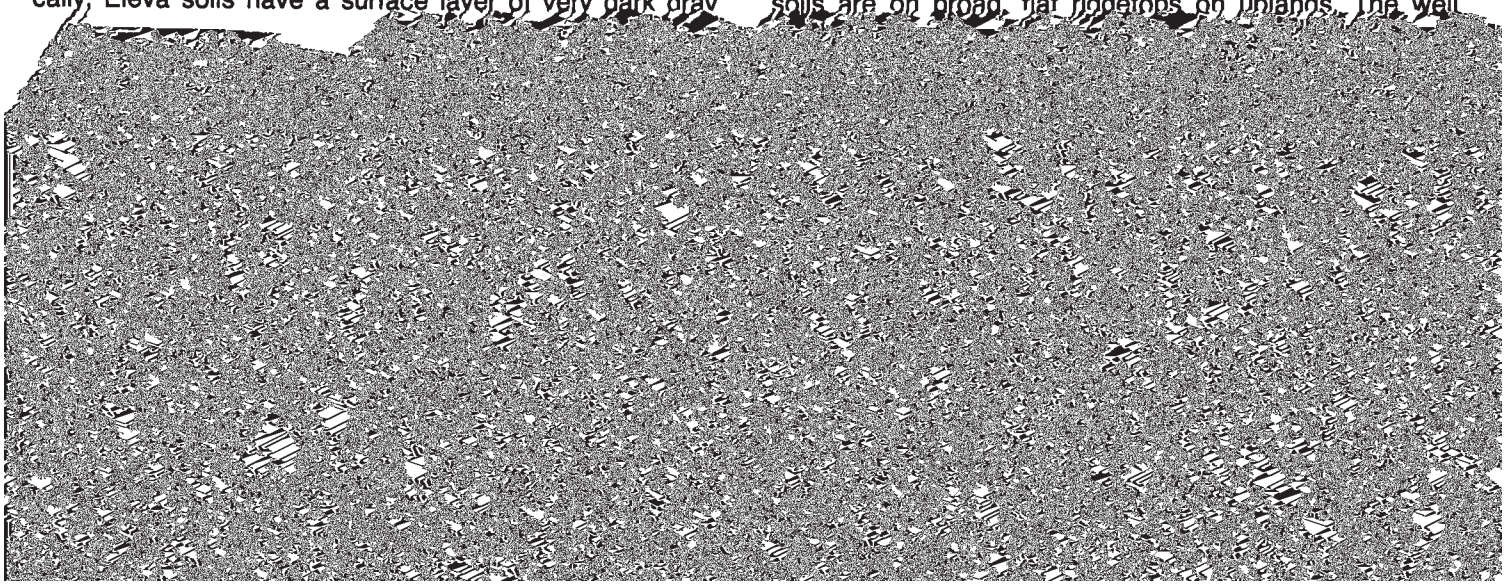


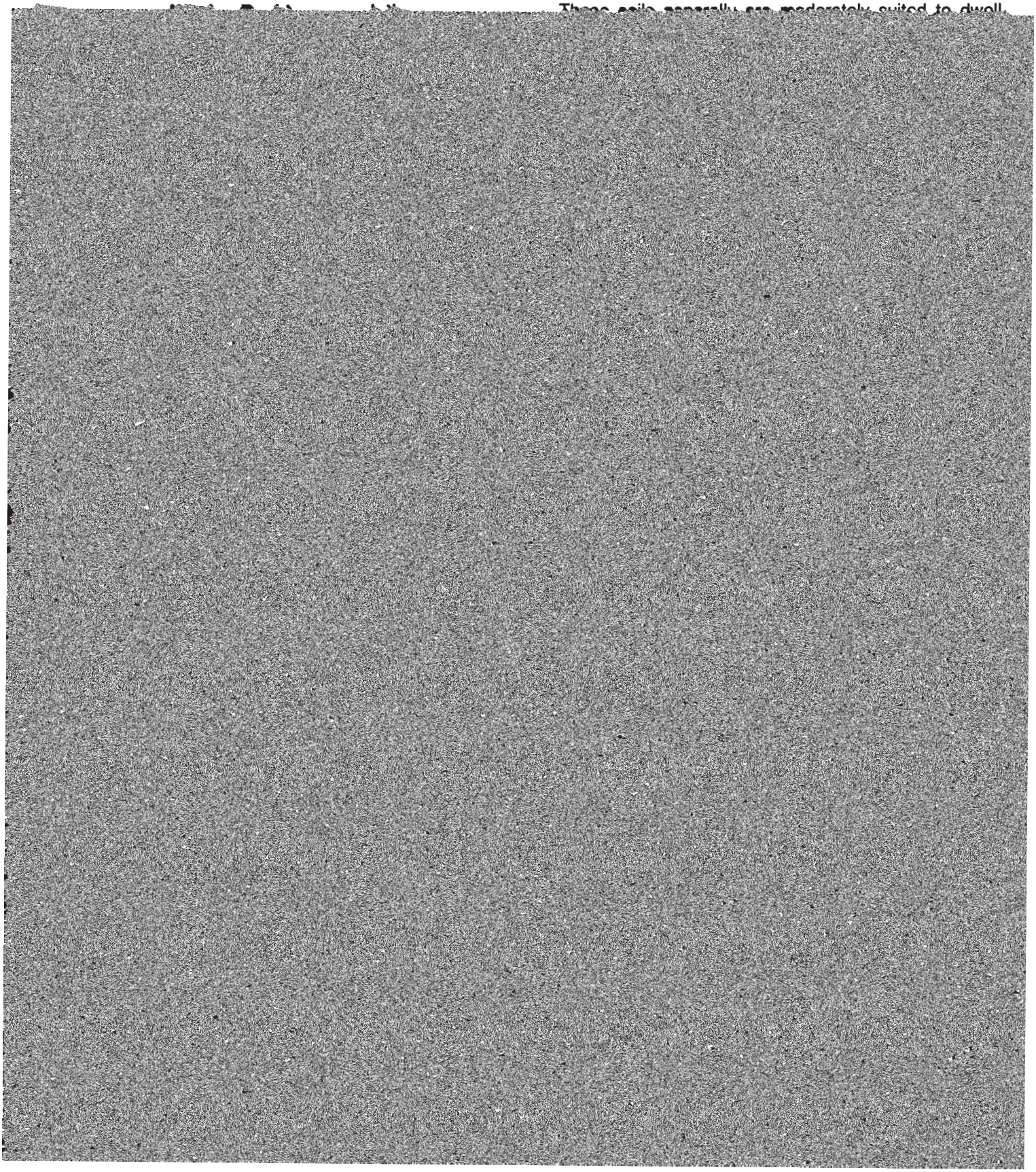
Figure 7.—Relationship of soils to topography and underlying material in the Boone-Eleva-Chelsea association.

Boone soils are excessively drained. These gently sloping to very steep soils are on uplands, mainly on ridgetops and valley side slopes. Boone soils typically have a surface layer of very dark grayish brown and dark brown sand about 3 inches thick. The substratum, to a depth of 34 inches, is light yellowish brown sand over weathered sandstone.

Eleva soils are somewhat excessively drained and well drained. These gently sloping to steep soils are on uplands, mainly on ridgetops and strong side slopes. Typically, Eleva soils have a surface layer of very dark gray

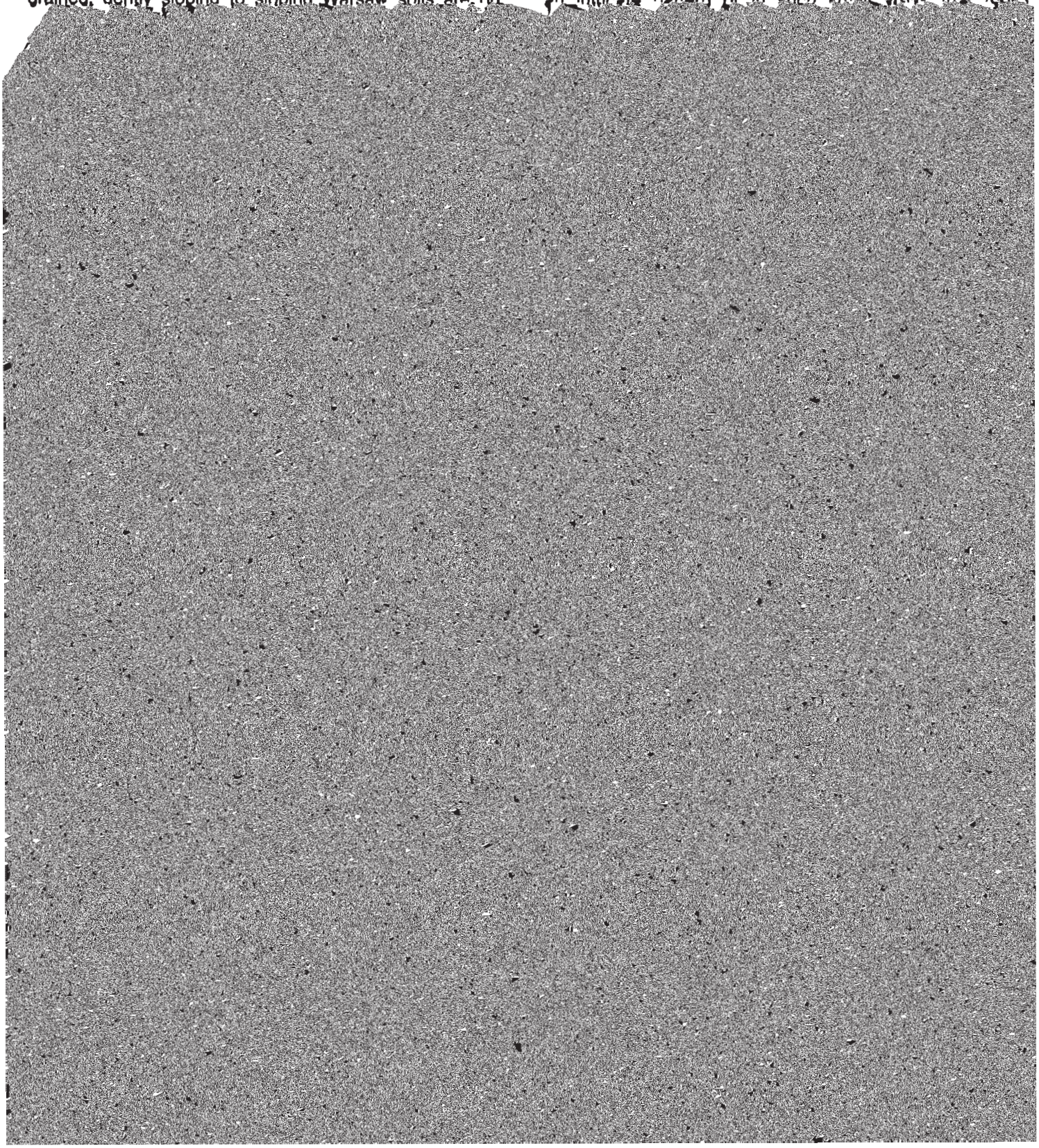
well drained, gently sloping to sloping Lamont soils are on convex knolls, side slopes, and parts of high stream benches on uplands. The well drained, nearly level to strongly sloping Martinsville soils are on terraces and outwash plains on uplands. The well drained, gently sloping to sloping Dickinson soils are on convex slopes and stream benches and in outwash areas on uplands. The poorly drained, nearly level Selma soils are on flats of outwash plains and along streams and drainageways. The well drained, nearly level to gently sloping Downs soils are on broad, flat ridgetops on uplands. The well





benches and in outwash areas on uplands. The well drained, gently sloping to sloping Warsaw soils are on

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they



crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is strongly acid or very strongly acid. The shrink-swell potential is moderate in the subsoil. Root development is restricted below a depth of about 30 inches by compact, reddish loamy till.

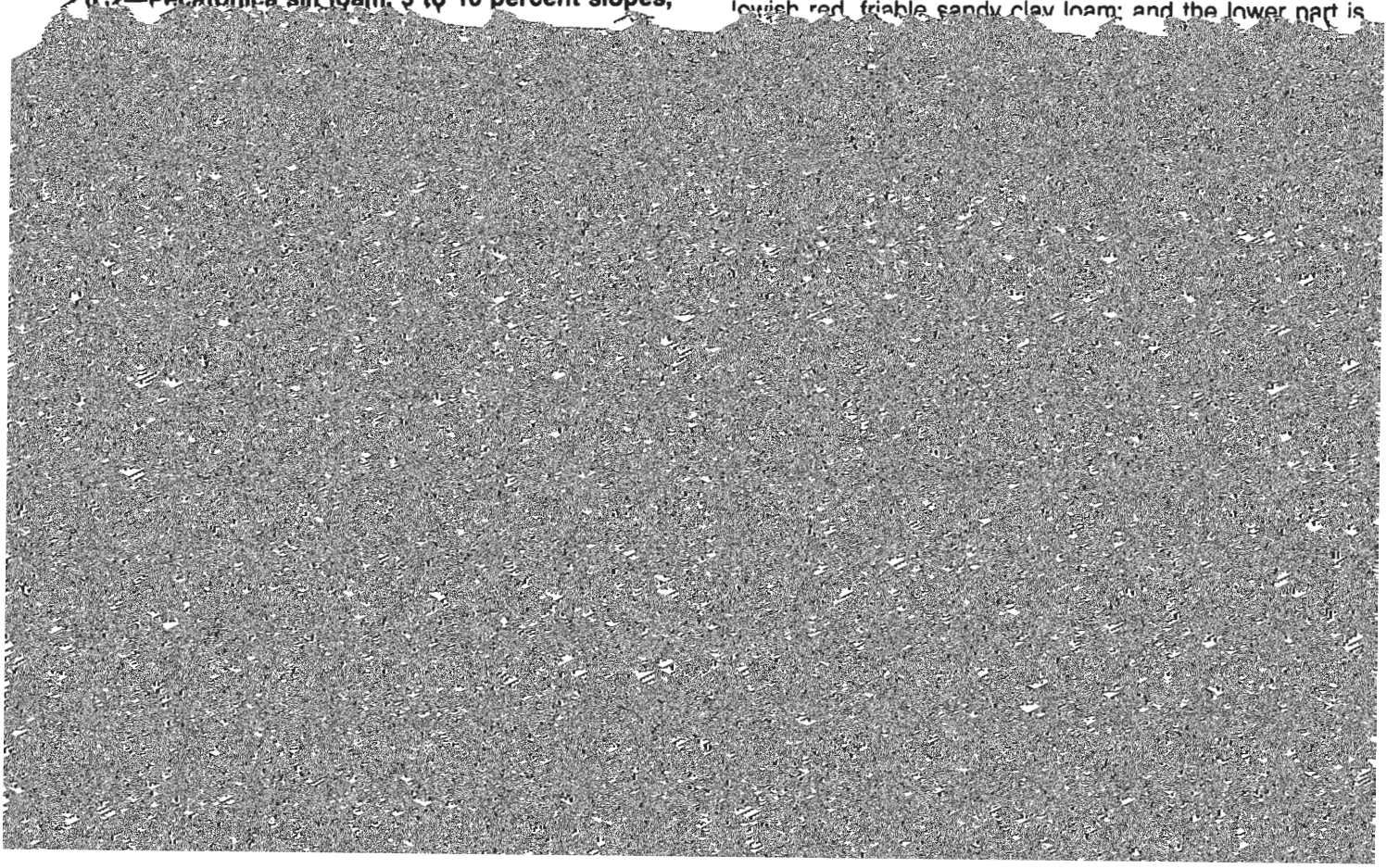
This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Conservation tillage, cover crops, and grassed waterways help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling.

This soil is suited to dwellings and septic tank absorption fields. Foundations for dwellings need to be designed to overcome the moderate shrink-swell potential of the soil. Local streets and roads are limited by low strength of the soil. Their quality can be improved by replacing the base material.

This soil is in capability subclass IIe.

21C2—Pecatonica silt loam, 5 to 10 percent slopes,



This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Conservation tillage, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling.

This soil is suited to dwellings and septic tank absorption fields. Foundations for dwellings need to be designed to overcome the moderate shrink-swell potential. Replacing the base material improves the quality of local streets and roads.

This soil is in capability subclass IIIe.

21D2—Pecatonica silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is along drainageways. Areas are long and narrow and range from 2 to 25 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is about 35 inches thick. The upper part is strong brown and yellowish brown, friable silty clay loam; the middle part is yellowish red, friable sandy clay loam; and the lower part is

Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. Slope is the main hazard when planting or harvesting trees.

This soil is only moderately suited to dwellings and septic tank absorption fields. Foundations for dwellings need to be designed to overcome the moderate shrink-swell potential. The slope may also require some alteration. The soil does not have sufficient strength and stability to support vehicular traffic, but strengthening or replacing the base material can correct this limitation. Slope is a limitation for septic tank absorption fields. This limitation can be overcome by placing filter lines on the contour.

This soil is in capability subclass IIIe.

22C2—Westville silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on upper parts of side slopes on uplands. Areas are irregular in shape and range from 2 to 20 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is about 37 inches thick. The upper part is yellowish brown silt loam; the middle part is strong brown clay loam; and the lower part is yellowish red sandy clay loam and sandy loam

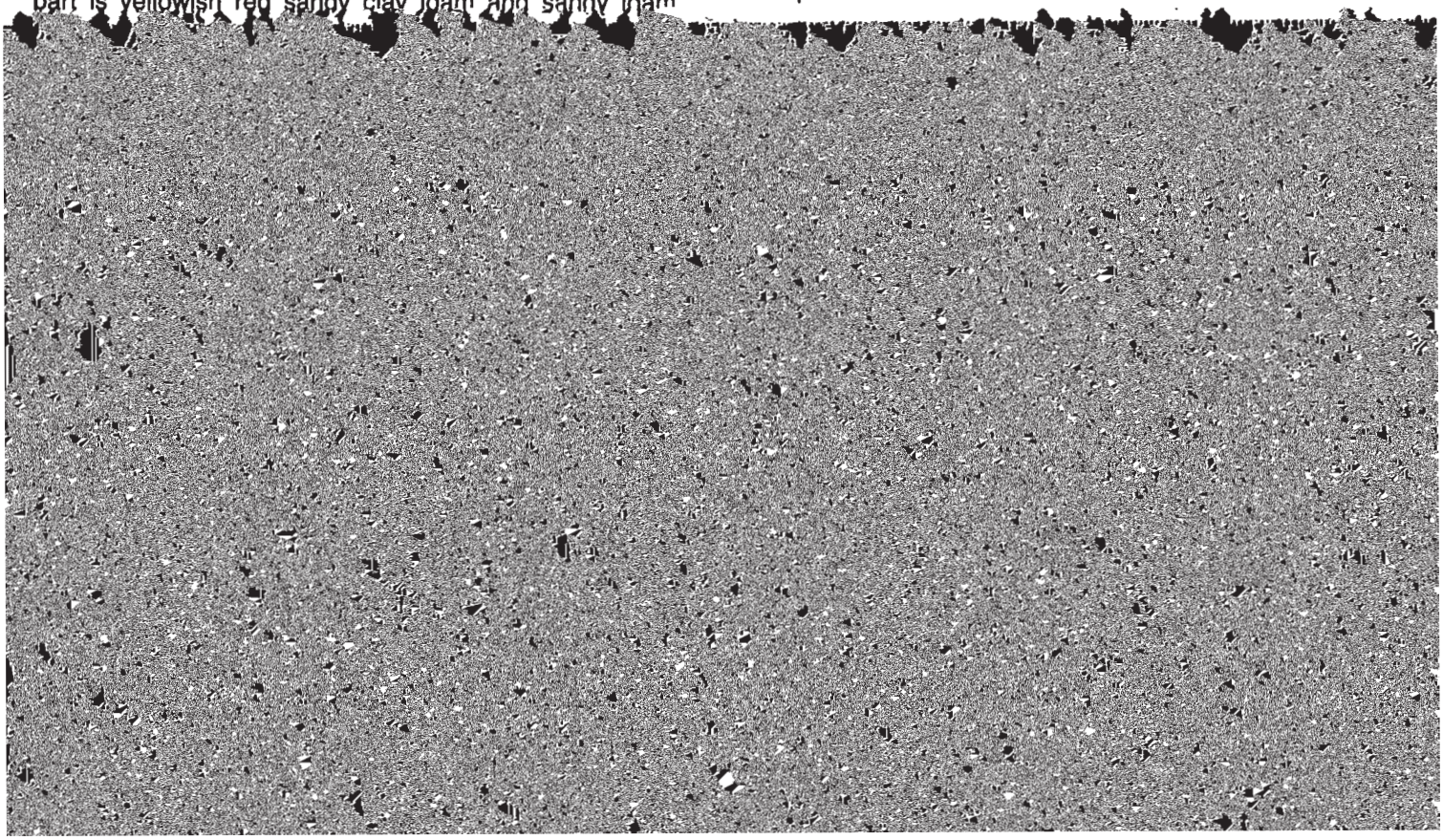
This soil is suited to building sites and septic tank absorption fields. There is a hazard of further erosion if large areas are not protected with a vegetative cover during construction. Foundations for dwellings need to be designed to overcome shrink-swell potential. This soil is limited by low strength for roads and streets. Roads and streets can be improved by replacing the base material.

This soil is in capability subclass IIe.

22D2—Westville silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on upland side slopes next to drainageways and streams. Areas are irregular in shape and range from 5 to 20 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is about 35 inches thick. The upper part is yellowish brown silt loam; the middle part is strong brown clay loam; and the lower part is yellowish red sandy clay loam and sandy loam. The substratum, to a depth of 60 inches, is mixed yellowish red and strong brown loam and sandy loam. In some places, the sandy loam till is closer to the surface than is typical. In some places, the soil is moderately well drained.

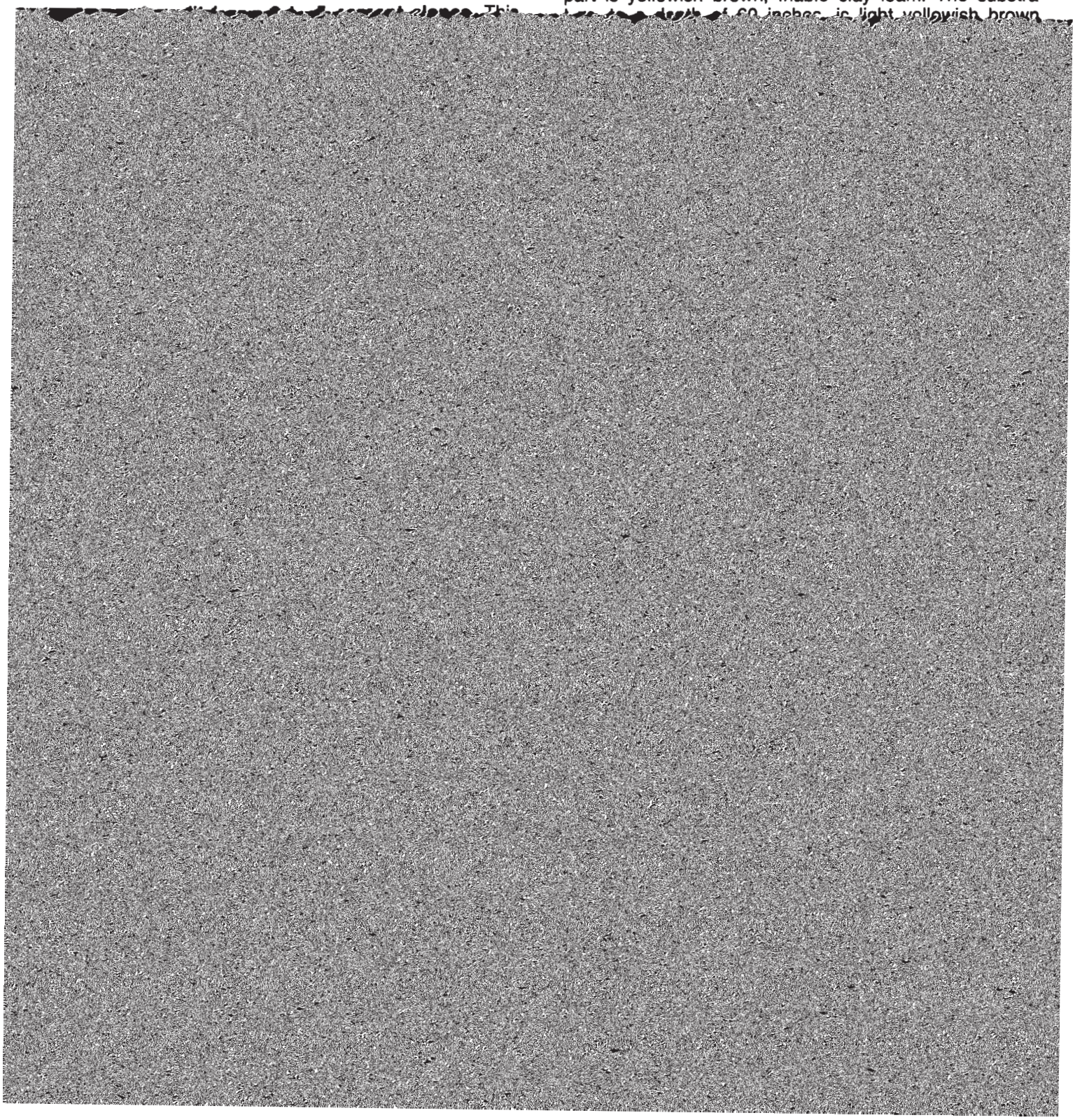
Included with this soil in mapping are small areas of well drained Whalan soils on side slopes. These soils have bedrock within a depth of 40 inches and make up 2 to 5 percent of the unit.



replacing the base material. The slope limitation for septic tank absorption fields can be overcome by placing the filter lines on the contour.

This soil is in capability subclass IIIe.

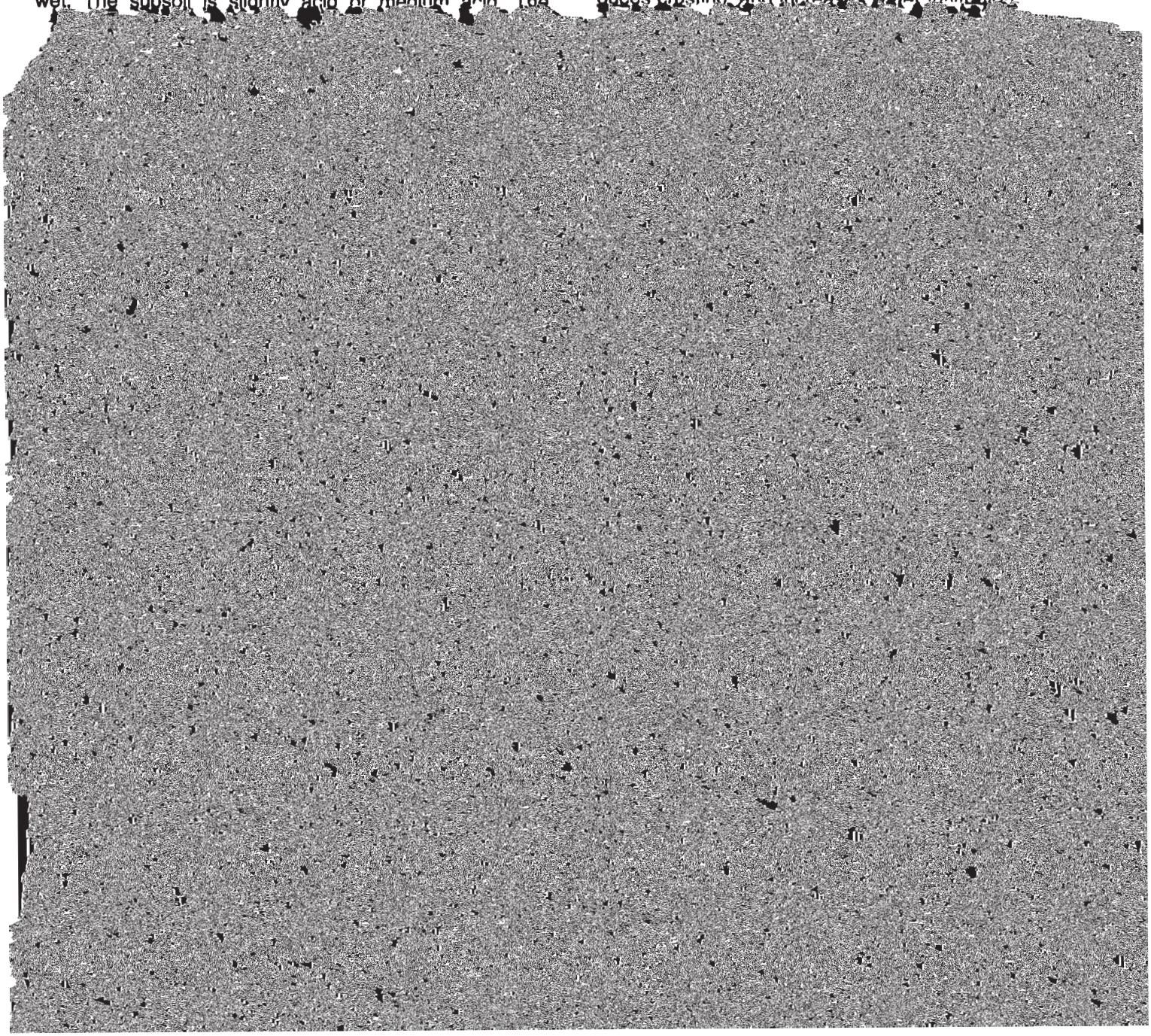
Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil is about 20 inches thick. The upper part is dark yellowish brown and yellowish brown, friable silty clay loam; and the lower part is yellowish brown, friable clay loam. The substra-



Included with this soil in mapping are small areas of somewhat poorly drained Kendall and Odell soils and poorly drained Drummer and Selma soils. These soils are in shallow depressions and make up 2 to 10 percent of the unit.

This Miami soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. The surface layer is about 2 percent organic matter. It is friable and easily tilled throughout a fairly wide range in moisture content. It crusts or puddles after hard rain, especially when worked wet. The subsoil is slightly acid or medium acid. The rain, especially in areas where the plow layer contains subsoil material. The subsoil is medium acid or slightly acid. The shrink-swell potential is moderate in the subsoil. Root development is somewhat restricted below a depth of about 38 inches by compact, loamy glacial till.

This soil is suited to corn, soybeans, small grain and grass and legume hay and pasture. If the soil is used for cultivated crops, there is erosion damage. Conservation tillage, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.



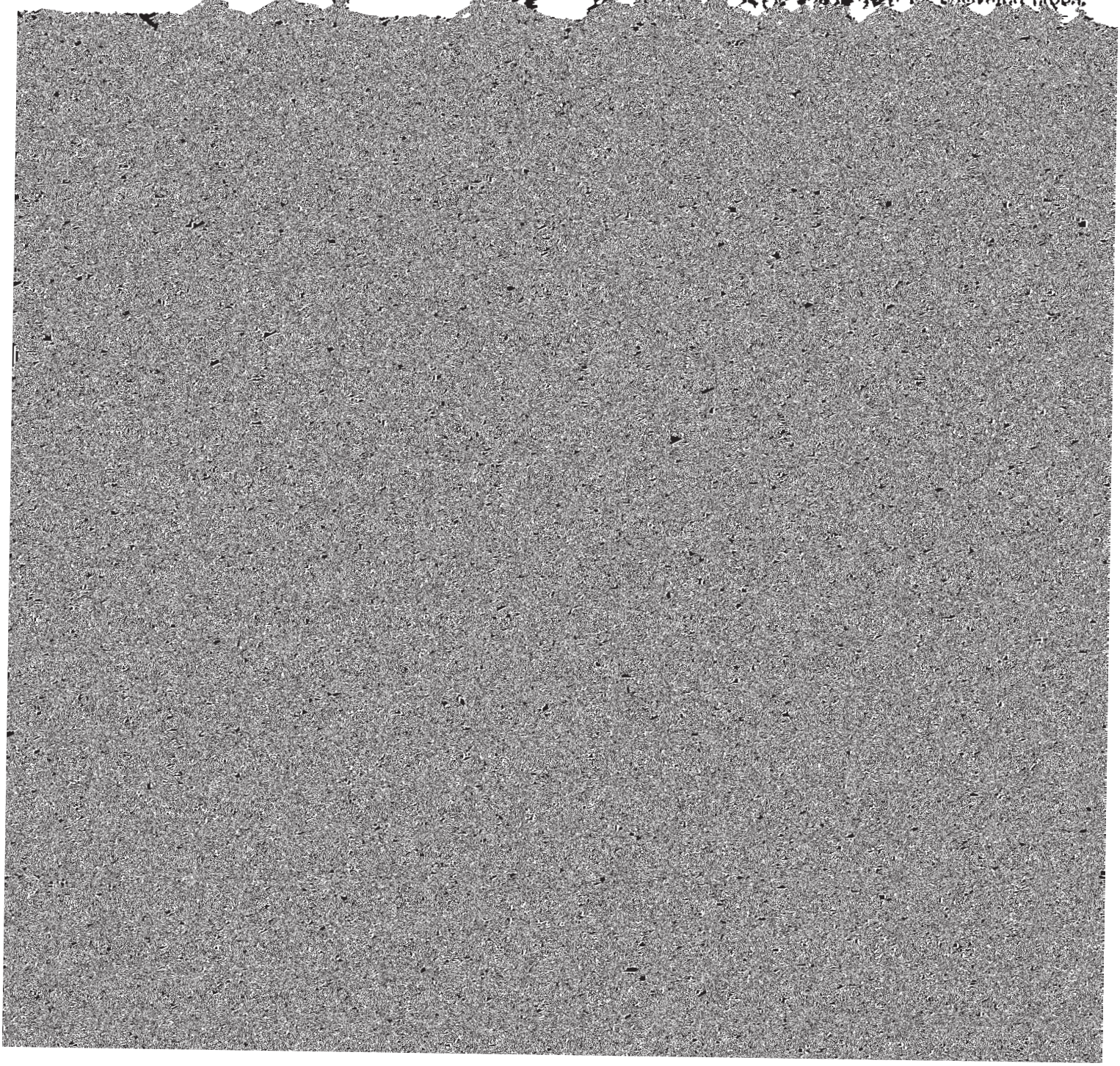
Some areas of this soil are cultivated. The soil has fair suitability for hay and pasture and good suitability for woodland. It has fair suitability for dwellings and poor suitability for septic tank absorption fields.

This soil is suited to small grain and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Conservation tillage, cover crops, contour farming, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regu-

organic matter. The subsoil is medium acid or slightly acid. The shrink-swell potential is moderate in the subsoil. Root development is restricted below a depth of about 32 inches by compact, loamy glacial till.

Some areas of this soil are cultivated. The soil has fair suitability for hay and pasture and good suitability for woodland. It has poor suitabilily for dwellings and septic tank absorption fields.

This soil is suited to small grain and grass and legume hay and pasture. If the soil is used for cultivated crops,

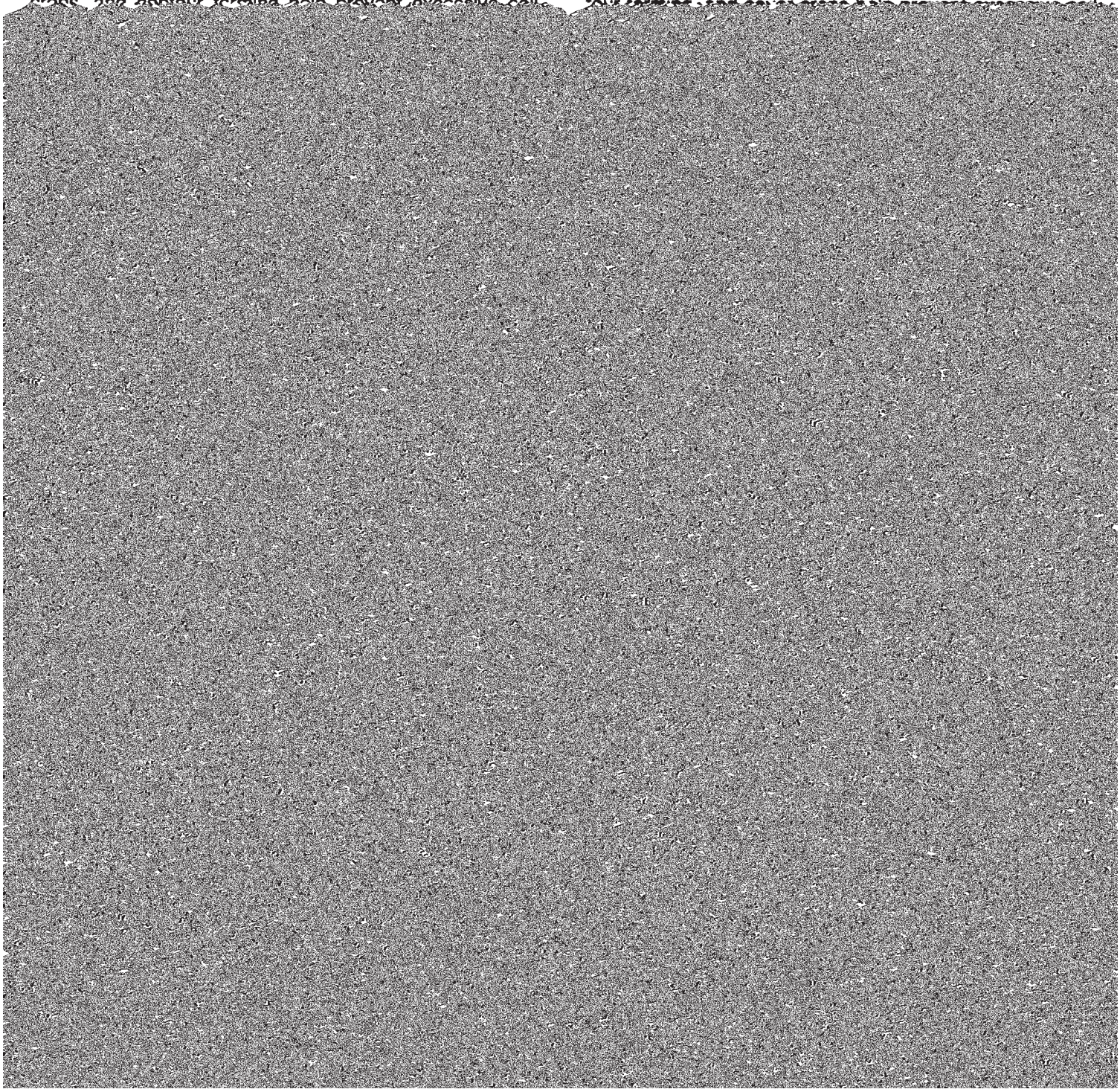


tains subsoil material. The subsoil is medium acid. In addition, it has moderate shrink-swell potential. This soil has a high susceptibility to frost action. Root development is restricted below a depth of 2 or 3 feet by limestone bedrock.

This soil is suited to small grain and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Conservation tillage, cover crops, and contour farming help prevent excessive soil

This Tama soil has moderate permeability. Runoff from cultivated areas is slow, and available water capacity is very high. The surface layer is about 3.5 percent organic matter. The subsoil is medium acid. The soil has a high susceptibility to frost heave. The shrink-swell potential is moderate.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. Minimum tillage, contour farming, and cover crops help prevent excessive soil



come the limitation of shrink-swell potential. The soil lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material. Damage to streets and roads from frost action can be reduced by replacing the base material.

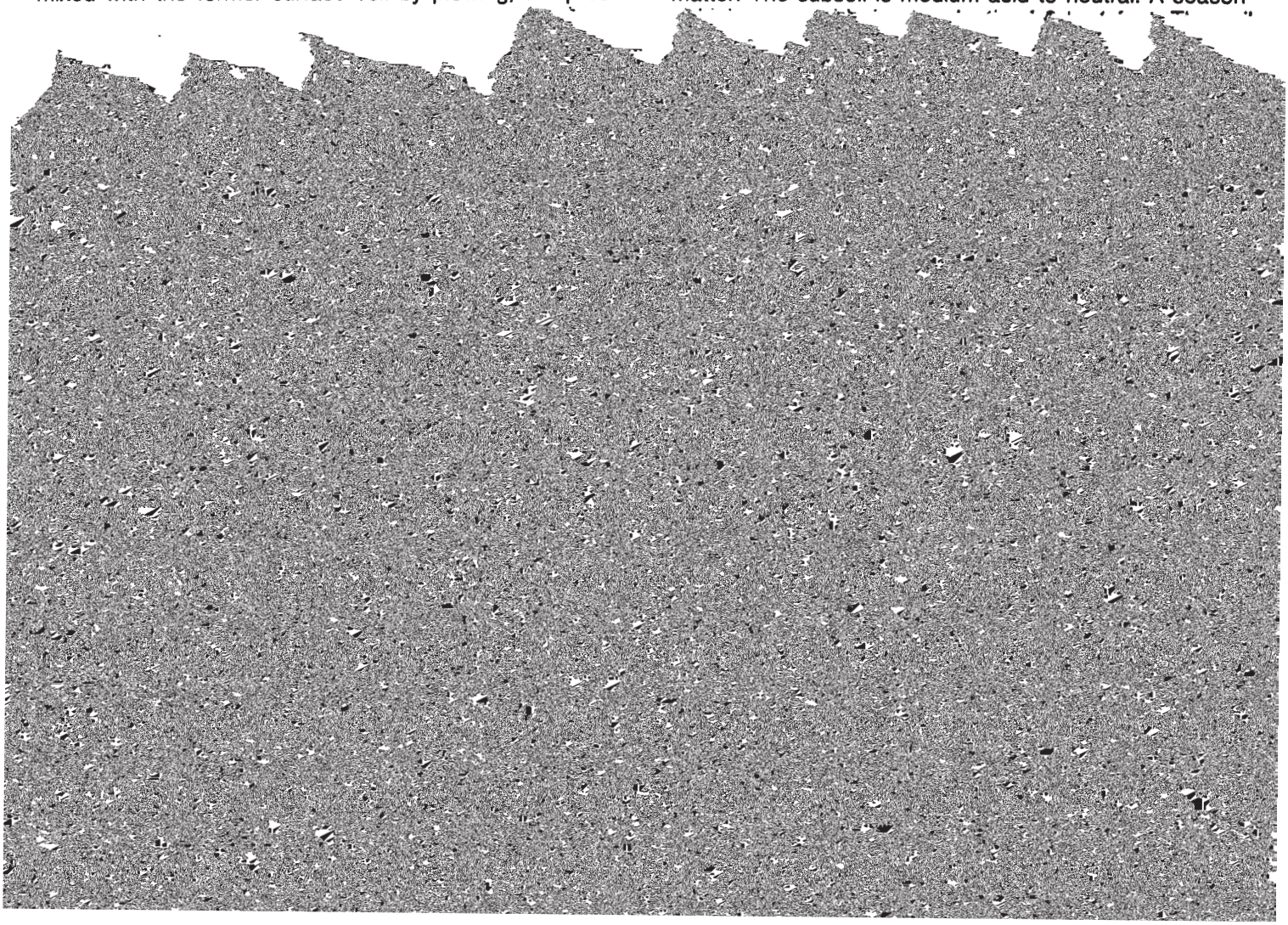
This soil is in capability subclass IIe.

36C2—Tama silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on convex side slopes of uplands. Areas are irregular in shape and range from 2 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsoil is about 40 inches thick. The upper part is dark brown, friable silty clay loam; the lower part is dark yellowish brown and yellowish brown, friable silty clay loam. The substratum, to a depth of about 60 inches, is brown and yellowish brown silt loam. In some places, the substratum is brown or reddish brown loam, clay loam, or sandy loam. Also, in areas where the upper part of the subsoil has been mixed with the former surface soil by plowing, the present surface layer is about 9 inches thick. The subsoil is about 34 inches thick. The upper part is very dark grayish brown silty clay loam; the middle part is dark grayish brown, mottled silty clay loam; and the lower part is grayish brown, mottled silty clay loam. The substratum, to a depth of about 60 inches, is yellowish brown and light olive gray, mottled, friable silt loam. In some areas, the amount of sand throughout the profile is higher than is typical. Also, in places, mixed sandy loam and loam layers are in the substratum at a depth of less than 60 inches.

Included with this soil in mapping are small areas of poorly drained Drummer and Sable soils. These soils are in shallow depressions and drainageways and make up 2 to 10 percent of the unit. Also included are small areas of well drained Catlin and Tama soils. These soils are at slightly higher positions on the landscape than this Muscatine soil and are better drained. The Catlin and Tama soils make up 5 to 10 percent of the unit.

This Muscatine soil has moderate permeability. Surface runoff is slow, and available water capacity is very high. The surface layer is about 4.5 percent organic matter. The subsoil is medium acid to neutral. A season-



is yellowish brown, firm clay loam. The substratum, to a depth of 60 inches, is yellowish brown, calcareous clay loam. In some places, the subsoil is thinner and shallower to calcareous material than is typical. In other areas, the subsoil contains more sand than is typical. In some places, the soil is moderately well drained.

Included with this soil in mapping are small areas of well drained Rockton and Ripon soils and somewhat poorly drained Elburn soils. Rockton and Ripon soils are in similar positions on the landscape as Sidell soils and are about 30 inches deep to limestone bedrock. Elburn soils are in drainageways. They have a sandy or loamy substratum. These soils make up 10 to 15 percent of the unit.

This Sidell soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. The surface layer is about 3.5 percent organic matter. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is neutral to medium acid. The shrink-swell potential is moderate in the subsoil. This soil has a high susceptibility to frost heave. Root development is restricted below a depth of about 50 inches by compact, loamy glacial till.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, cover crops, contour farming, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to dwellings when foundations are designed to overcome the shrink-swell potential. It lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material. Damage from frost action to streets and roads can be reduced by replacing the base material. The slow absorption of effluent is a limitation for septic tank absorption fields, but this can be overcome by increasing the size of the absorption area. Excessive seepage from sewage lagoons can be prevented by sealing the bottom of the lagoon.

This soil is in capability subclass IIe.

60C2—La Rose silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on convex ridgetops, knolls, and short uneven side slopes. Areas are irregular in shape and range from 3 to 15 acres in size.

Typically, the surface layer is very dark grayish brown and dark brown silt loam about 8 inches thick. The subsoil is dark brown, friable clay loam about 12 inches thick. The substratum, to a depth of 60 inches, is brown, calcareous loam. In some places, the subsoil is thicker and deeper to calcareous material than is typical. Also, in areas where the upper part of the subsoil has been mixed with the former surface layer by plowing, the present surface layer is dark brown clay loam. In some places, the soil is moderately well drained.

Included with this soil in mapping are small areas of somewhat poorly drained Elburn and Flanagan soils. These soils are in drainageways or on foot slopes and make up 2 to 10 percent of the unit.

This La Rose soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is moderate. The surface layer is about 2 percent organic matter. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is mildly alkaline. Root development is restricted below a depth of about 24 inches by compact, loamy glacial till.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, cover crops, contour farming, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods help keep the pasture and soil in good condition.

This soil is suited to dwellings. It lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material. The slow absorption of effluent is a limitation for septic tank absorption fields, but this can be overcome by increasing the size of the absorption area. Slope limits use of this soil for sewage lagoons.

This soil is in capability subclass IIIe.

61—Atterberry silt loam. This nearly level, somewhat poorly drained soil is on broad stream terraces and upland plains. Areas are irregular in shape and range from 2 to 100 acres in size.

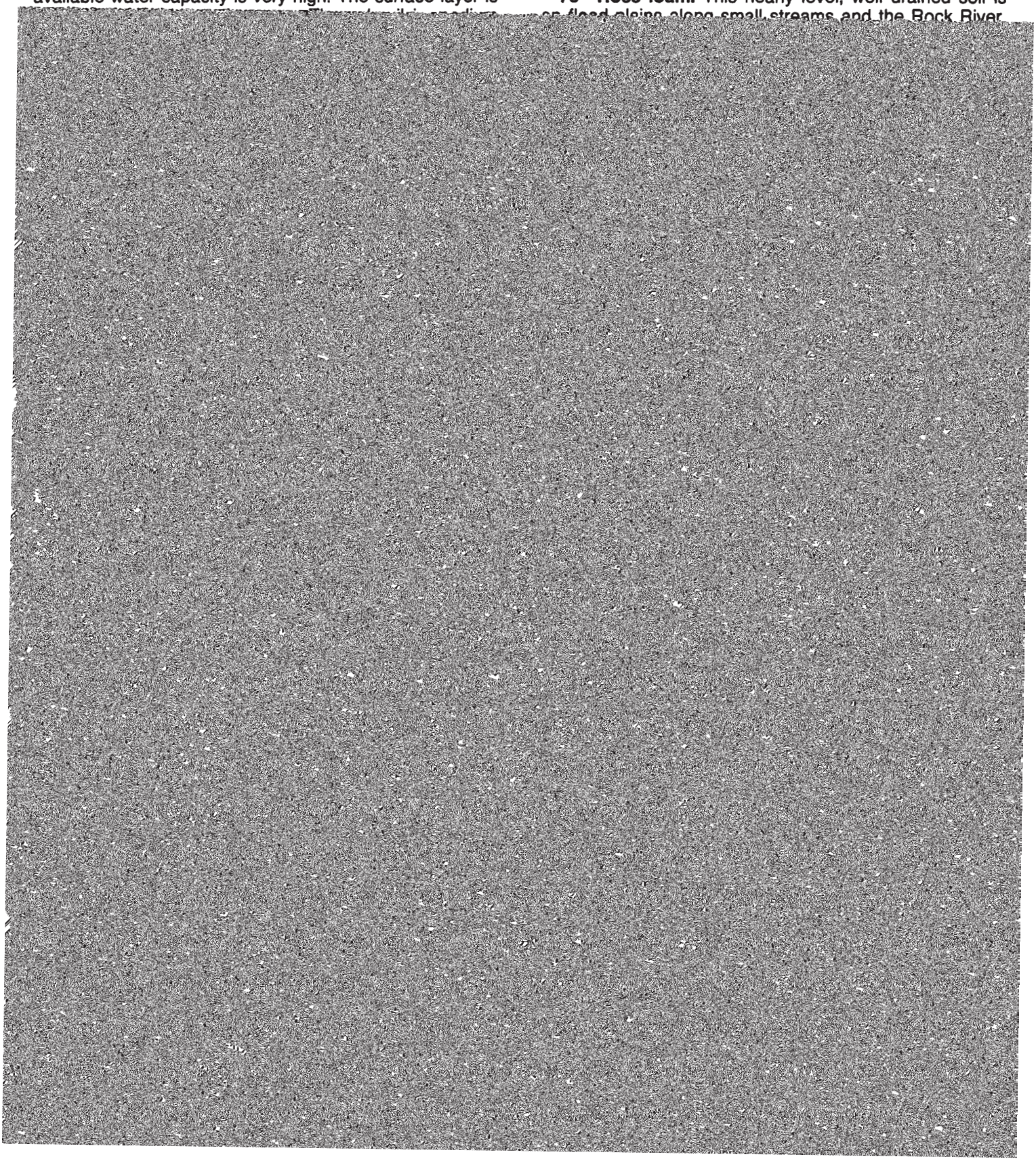
Typically, the surface layer is very dark gray silt loam mixed with some dark brown silt loam and is about 6 inches thick. The subsurface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is about 36 inches thick. The upper part is mottled, dark grayish brown silty clay loam; the middle part is mottled, olive silty clay loam; and the lower part is olive gray, light olive gray, olive, and yellowish brown silty clay loam. The substratum, to a depth of about 60 inches, is yellowish brown silty clay loam. In some places, the surface layer is thicker than is typical. In a few places, the surface layer is light colored.

Included with this soil in mapping are small areas of well drained Downs and Fayette soils. These soils are at slightly higher positions on the landscape than the Atterberry soil and make up 2 to 10 percent of the unit.

This Atterberry soil has moderate permeability to moderately slow permeability. Surface runoff is slow, and

available water capacity is very high. The surface layer is

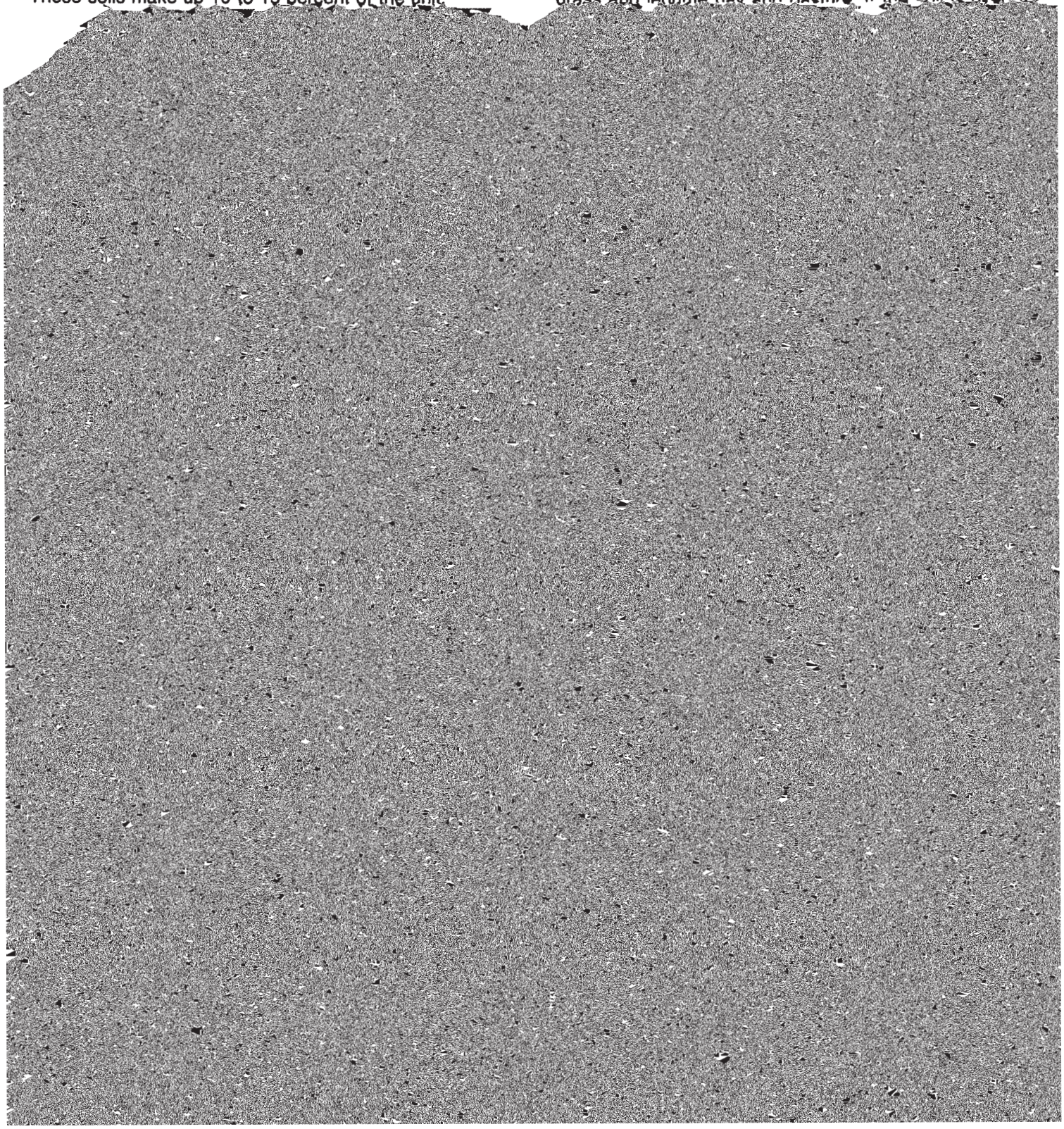
73—Ross loam. This nearly level, well drained soil is on flood plains along small streams and the Rock River



soils have a thicker surface layer and do not have a buried soil in the substratum. Comfrey soils are nearer streams and have more sand than this Radford soil. These soils make up 10 to 15 percent of the unit.

subsurface layer. This soil has a high frost heave potential.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for



stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is generally not suited to dwellings and septic tank absorption fields because of the seasonal high water table and the flooding hazard.

This soil is in capability subclass IIw.

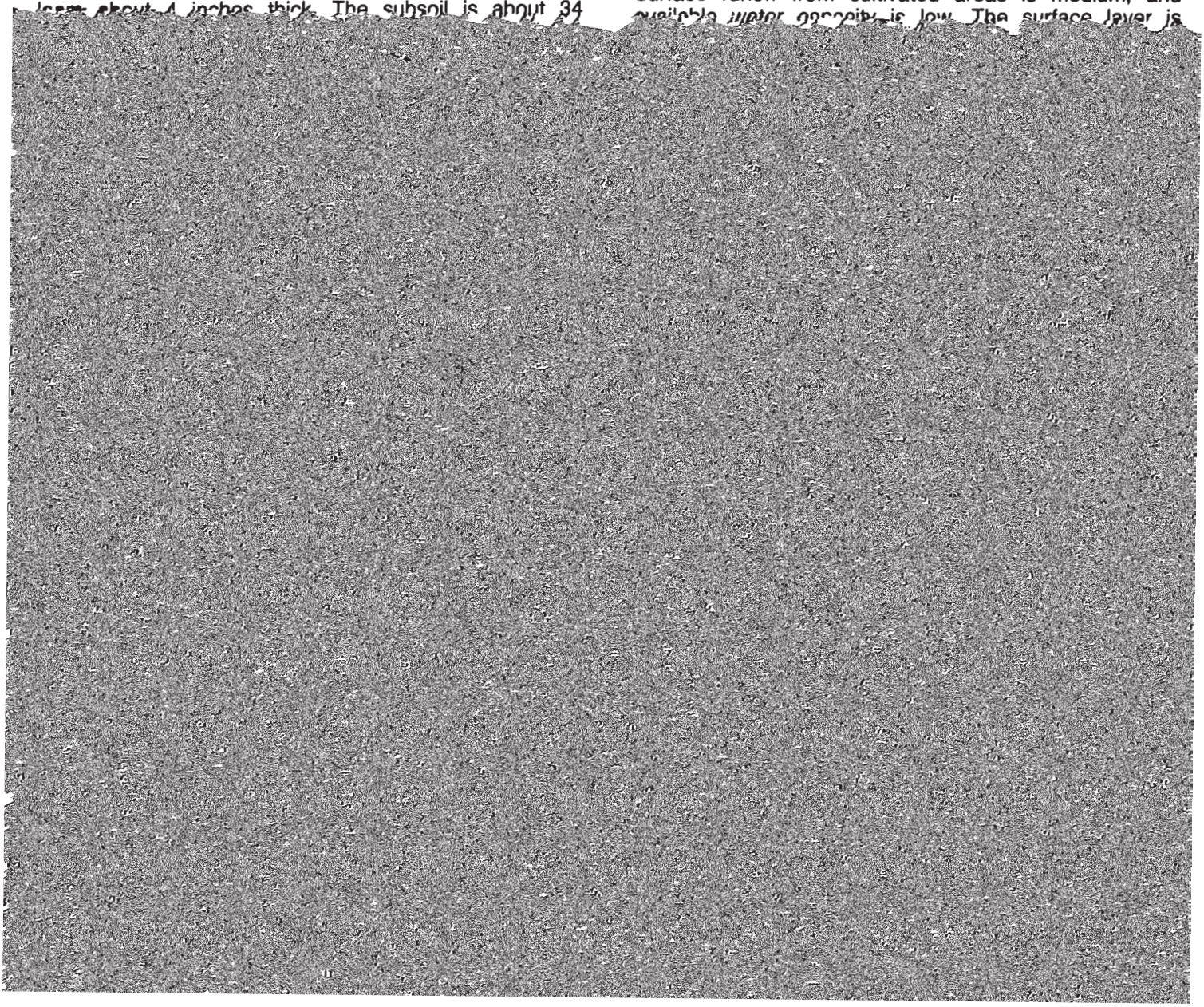
87B—Dickinson sandy loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on low ridges shaped like dunes, on upland divides, and on stream terraces. Areas are irregular in shape and range from 2 acres to about 40 acres in size.

Typically, the surface layer is very dark grayish brown, friable sandy loam about 8 inches thick. The subsurface layer is very dark grayish brown and dark brown sandy loam about 4 inches thick. The subsoil is about 34

Typically, the surface layer is very dark grayish brown, friable sandy loam about 7 inches thick. The subsurface layer is dark brown sandy loam about 3 inches thick. The subsoil is about 30 inches thick. The upper part is dark brown sandy loam and loamy sand, and the lower part is dark yellowish brown loamy sand. The substratum, to a depth of 60 inches, is yellowish brown sand. In some places, the subsoil and substratum are siltier than is typical. In some areas, the surface layer is loamy sand.

Included with this soil in mapping are small areas of somewhat poorly drained La Hogue and Millbrook soils. These soils are in drainageways and they make up 2 to 10 percent of the unit.

This Dickinson soil has moderately rapid permeability in the subsoil and rapid permeability in the substratum. Surface runoff from cultivated areas is medium, and available water capacity is low. The surface layer is



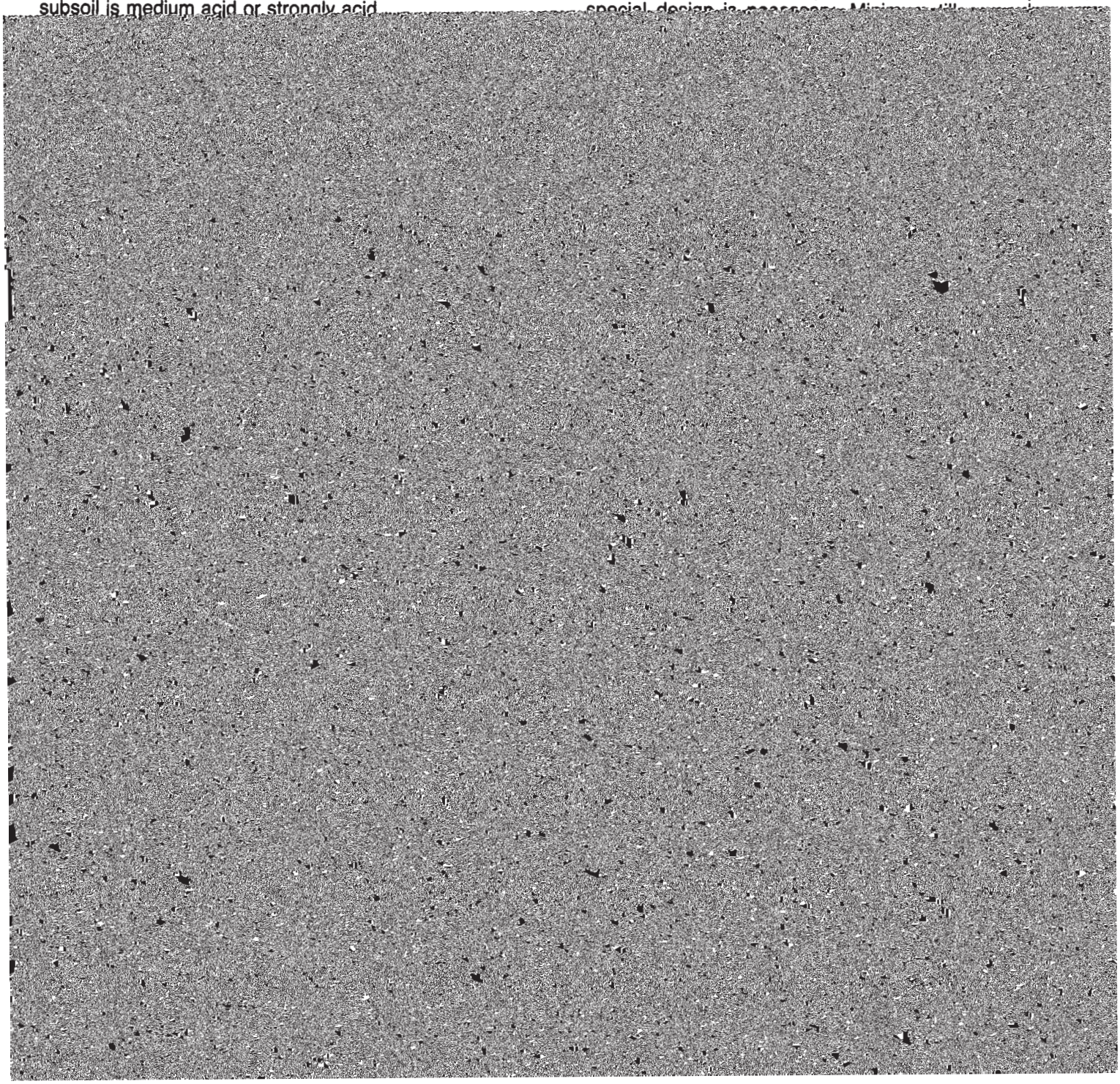
clay and is lighter colored than is typical. Gravel is at a depth of less than 40 inches in some places.

Included with this soil in mapping are small areas of the somewhat excessively drained Eleva soils. This sandy soil has sandstone at a depth of 20 to 40 inches.

The Sparta soil has rapid permeability. Surface runoff is slow to medium, and available water capacity is low. The surface layer is about 2 percent organic matter. The subsoil is medium acid or strongly acid.

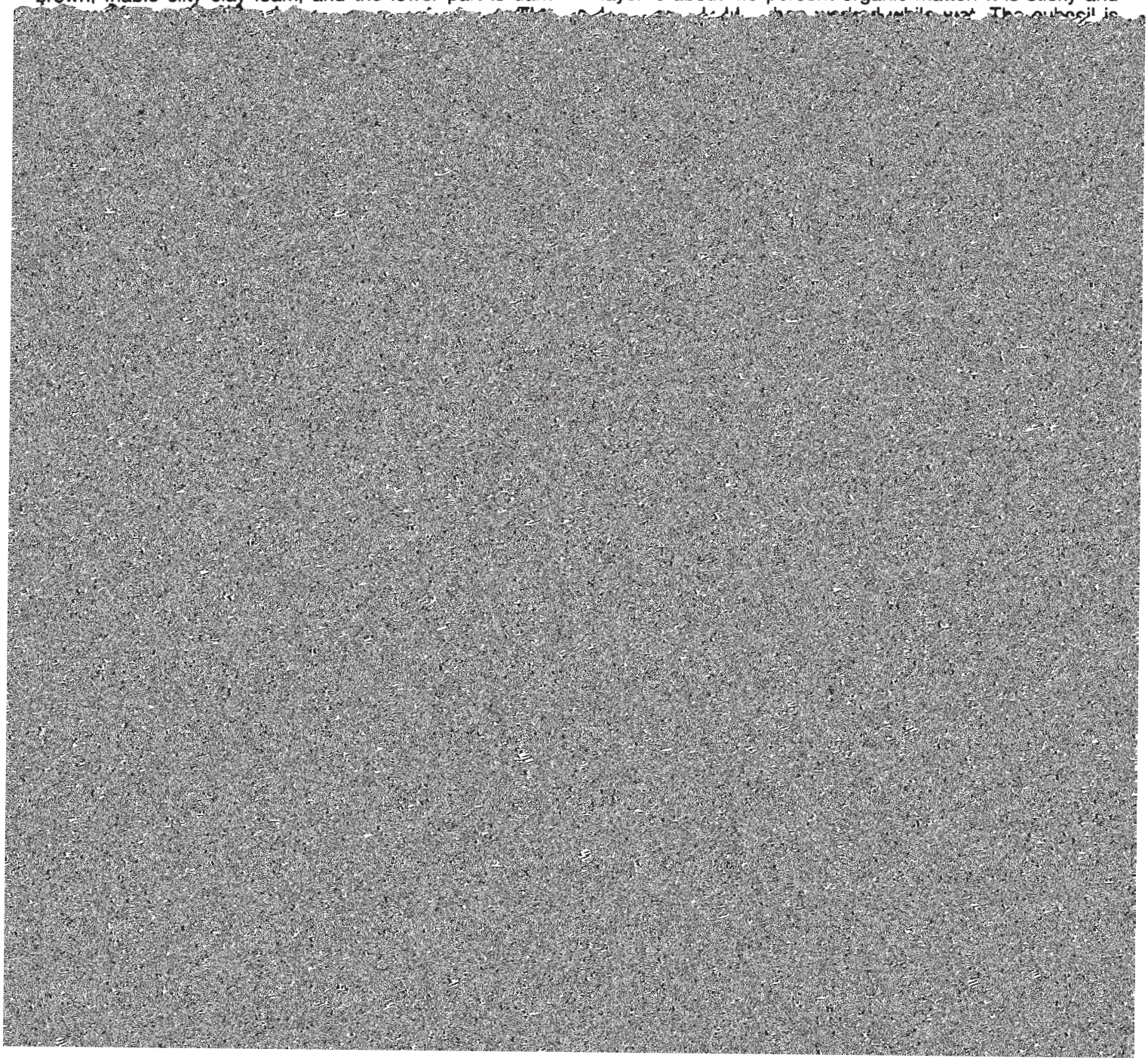
layer is about 3.5 percent organic matter. The shrink-swell potential is moderate in the subsoil. The soil has a high frost action potential.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. Artificial drainage is needed in some areas to obtain optimum yields. Subsurface drainage functions satisfactorily, but because sandy layers are in the lower part of the subsoil in places, special design is necessary. Minimum tillage



105B—Batavia silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on divides, interfluves, and side slopes on uplands. Areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsurface layer is dark grayish brown and very dark grayish brown silt loam about 4 inches thick. The subsoil is about 41 inches thick. The upper part is dark yellowish brown, friable silt loam; the middle part is dark yellowish brown and dark brown, friable silty clay loam; and the lower part is dark



few places, thin layers of silty overwash are on the surface.

Included with this soil in mapping are small areas of somewhat poorly drained Lawson, Orion, and Radford soils. These soils are adjacent to Sawmill soils and make up about 2 to 10 percent of the unit.

This Sawmill soil has moderate permeability. Surface runoff from cultivated areas is slow, and available water capacity is very high. This soil is subject to a seasonal high water table within 2 feet of the surface. The surface layer is about 4.5 percent organic matter. It is sticky and

This soil is suited for corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, cover crops, contour farming, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water intake.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet causes surface compaction, excessive runoff, and poor tilth. Pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is only moderately suited to dwellings because of the shrink-swell potential, but foundations can be designed to overcome this limitation. The soil is poorly suited to septic tank absorption fields because of the moderately slow permeability in the lower part of the soil and the seasonal high water table. These limitations can be partly overcome by increasing the size of the absorption field. The seasonal high water table can be lowered by installing a subsurface drainage system.

This soil is in capability subclass IIe.

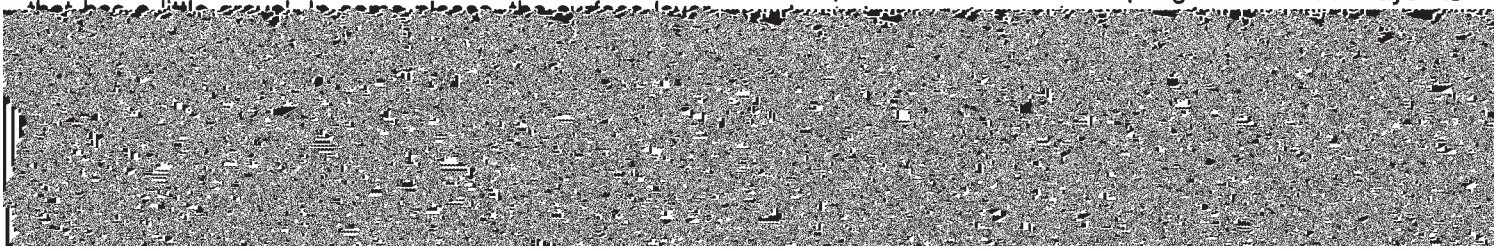
123—Riverwash. Riverwash consists of coarse, loose, sandy and gravelly material on natural levees along the major streams in the county. Large amounts of sand and gravel have been deposited over relatively small and irregular areas. Riverwash is subject to frequent flooding for long periods throughout the year. Many areas are along the streambank, and the size and shape of these areas can change entirely with each new flood.

Riverwash is not suited to farming, woodland, or building sites. Where this land is accessible, it is a source of local sand or gravel.

This soil is in capability class VIII.

125—Selma clay loam. This nearly level, poorly drained soil is on flats and in depressions of sandy outwash plains and stream terraces. It is subject to occasional flooding for brief periods in spring. Areas are irregular in shape and range from 6 to 550 acres in size.

Typically, the surface layer is black clay loam about 10 inches thick. The subsurface layer is black, very dark gray, and dark gray loam about 12 inches thick. The subsoil is about 23 inches thick. The upper part is gray, friable loam; the lower part is gray, stratified loam, clay loam, and sandy loam. The substratum, to a depth of about 60 inches, is gray, stratified loam and sandy loam that has a little gravel. In some places the surface layer



stratum. Odell soils have a loamy subsoil and substratum. Radford soils have silty alluvium over a dark colored, buried soil. These soils make up 10 to 15 percent of the unit.

This Selma soil has moderate permeability in the subsoil and moderate to moderately rapid permeability in the substratum. Surface runoff is very slow or the soil is ponded, and available water capacity is high. In undrained areas, the seasonal high water table is within 2 feet of the surface. The surface layer is about 5 percent organic matter. The subsoil is mildly alkaline, the shrink-swell potential is moderate, and the frost action potential is high.

This soil is used mainly for corn, soybeans, and some vegetable crops. If the soil is used for cultivated crops, protecting the area from flooding and maintaining artificial drainage minimize crop damage. Subsurface drainage works well where adequate outlets are available. Soil erosion is a limitation if the soil is left bare and exposed for a considerable period of time.

This soil is generally not suited to dwellings and septic tank absorption fields because of the seasonal high water table and occasional flooding.

This soil is in capability subclass IIw.

145B—Saybrook silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on convex ridgetops and knolls and on broad divides on uplands. Areas are irregular in shape and range from 2 acres to about 200 acres in size.

Typically, the surface layer is very dark gray and very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is very dark grayish brown and dark brown silt loam about 3 inches thick. The subsoil is about 23 inches thick. The upper part is brown silty clay loam, the middle part is grayish brown silty clay loam, and the lower part is yellowish brown loam. The substratum, to a depth of 60 inches, is brown, calcareous loam. In some places, the subsoil is thicker and deeper to calcareous material than is typical. Also, in some places the surface layer is thinner, and in a few areas the upper part of the subsoil is clay loam. In some places, the soil is well drained.

Included with this soil in mapping are small areas of somewhat poorly drained Elburn and Flanagan soils. These soils are in depressions and drainageways and make up 5 to 10 percent of the unit.

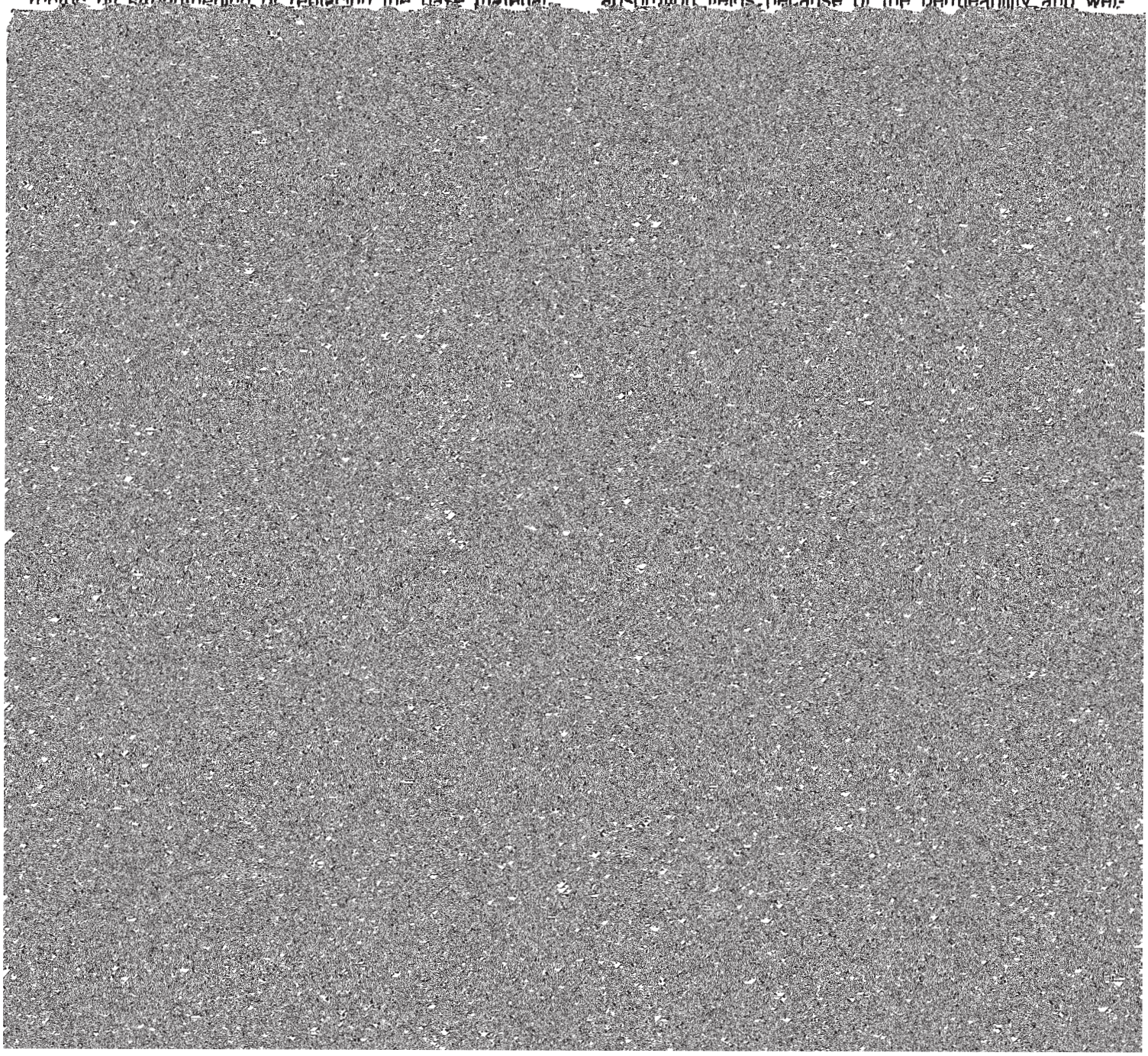
This Saybrook soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. A seasonal high water table is at a depth of 4 to 6 feet in spring. The surface layer is

the soil is used for row crops. Minimum tillage, cover crops, contour farming, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains tilth, reduces crusting, and makes seedbed preparation easier.

This soil is only moderately suited to dwellings and septic tank absorption fields. Foundations of dwellings can be designed to overcome shrinking and swelling of the soil. The soil lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material.

making regular additions of other organic material maintain tilth, reduce crusting, and make seedbed preparation easier.

This soil is only moderately suited to dwellings. Foundations can be designed to overcome the shrinking and swelling of the soil. The soil lacks sufficient strength to support streets and sidewalks, but this limitation can be overcome by strengthening or replacing the base material. Frost action severely affects roads and streets, but this limitation can be reduced by replacing the base material. The soil is only moderately suited to septic tank absorption fields because of the permeability and wet-



surface water helps overcome wetness and flooding limitations for dwellings without basements. The soil lacks sufficient strength and stability to support vehicular traffic. Suitable base material must be added during road and street construction. Sanitary facilities should be connected to commercial sewers.

This soil is in capability subclass IIw.

154A—Flanagan silt loam, 0 to 3 percent slopes. This nearly level to very gently sloping, somewhat poorly drained soil is on convex side slopes and along drainageways on uplands. Areas are irregular in shape and range from 2 to 80 acres in size.

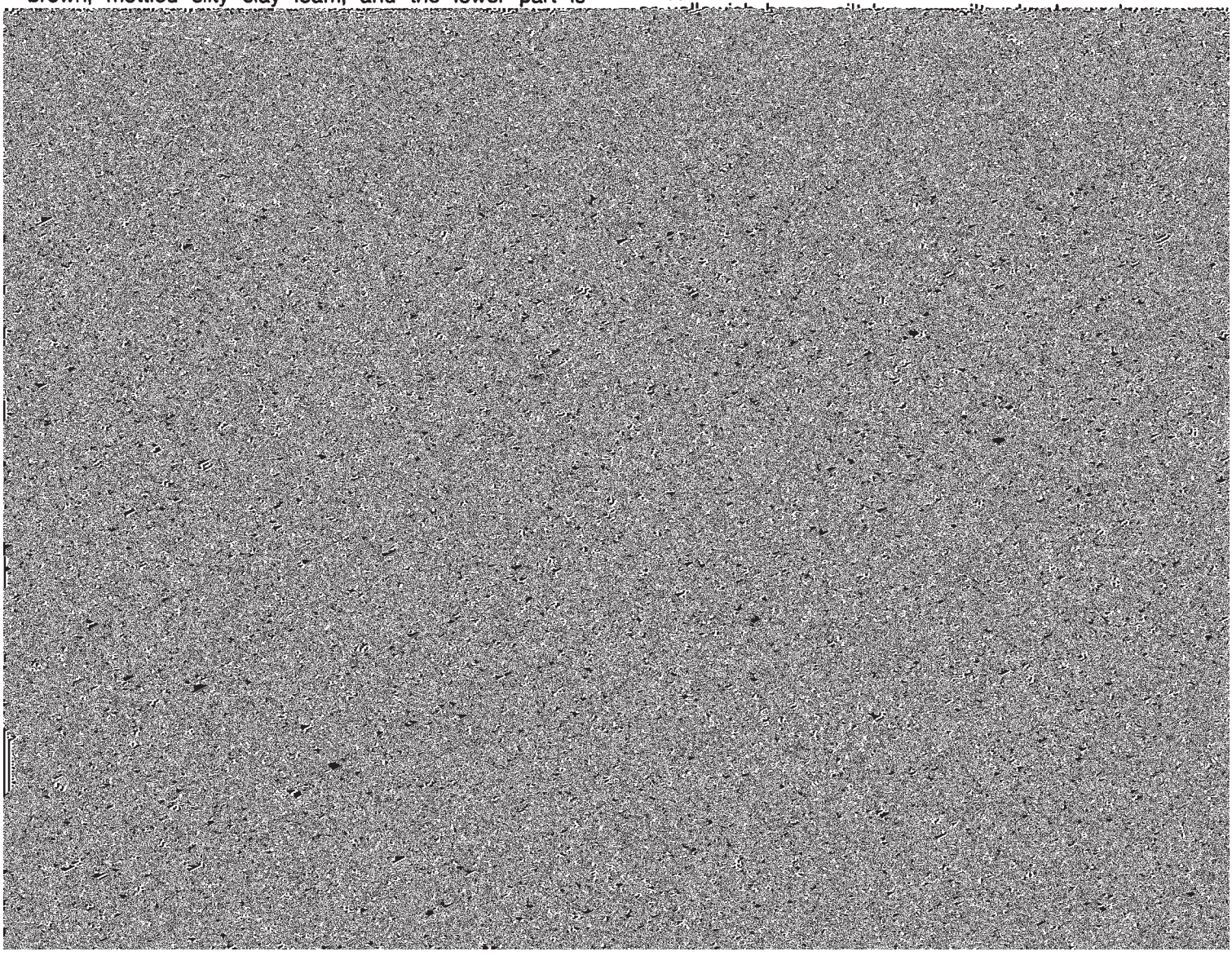
Typically, the surface layer is black silt loam about 8 inches thick. The subsurface layer is very dark gray silty clay loam about 4 inches thick. The subsoil is about 40 inches thick. The upper part is dark grayish brown, mottled, friable silty clay loam; the middle part is grayish brown, mottled silty clay loam; and the lower part is

problems can be partly overcome by increasing the size of the absorption field and lowering the water table with a subsurface drainage system.

This soil is in capability class I.

171A—Catlin silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on broad, convex slopes. Areas are irregular in shape and range from 3 to 150 acres in size.

Typically, the surface layer is very dark brown silt loam about 11 inches thick. The subsoil is about 38 inches thick. The upper part is brown and dark brown, friable silty clay loam; the middle part is yellowish brown, dark brown, and light brownish gray, mottled, firm silty clay loam; and the lower part is dark yellowish brown, firm clay loam. The substratum, to a depth of 60 inches, is yellowish brown, calcareous loam. In some places, the subsoil is thicker and deeper to calcareous material than is typical. In a few areas, the substratum is reddish loam



Typically, the surface layer is very dark brown silt loam about 10 inches thick. The subsoil is about 36 inches thick. The upper part is brown and dark brown, friable silty clay loam; the middle part is yellowish brown, mottled, firm silty clay loam; and the lower part is dark yellowish brown, firm clay loam. The substratum, to a depth of 60 inches, is yellowish brown, calcareous loam. In some places, the subsoil is thicker and deeper to calcareous material than is typical. In few areas, the substratum is reddish loam or yellowish brown silt loam. In some places the soil is well drained.

Included with this soil in mapping are small areas of moderately well drained Assumption soils. These soils are silty to a depth of about 30 inches over a gray, clay loam buried soil. They are in convex positions along drainageways. Also included are small areas of somewhat poorly drained Flanagan soils in drainageways. The included soils make up 10 to 15 percent of the unit.

This Catlin soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. A seasonal high water table is at a depth of 3 to 6 feet in spring. The surface layer is about 3.5 percent organic matter. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is neutral to medium acid. The shrink-swell potential is moderate in the subsoil. The frost action potential is high. Root development is restricted below a depth of about 50 inches by compact, loamy glacial till.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, winter cover crops, and grassed waterways help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suitable for dwellings and septic tank absorption fields. Foundations can be designed to overcome the shrink-swell potential. The soil lacks sufficient

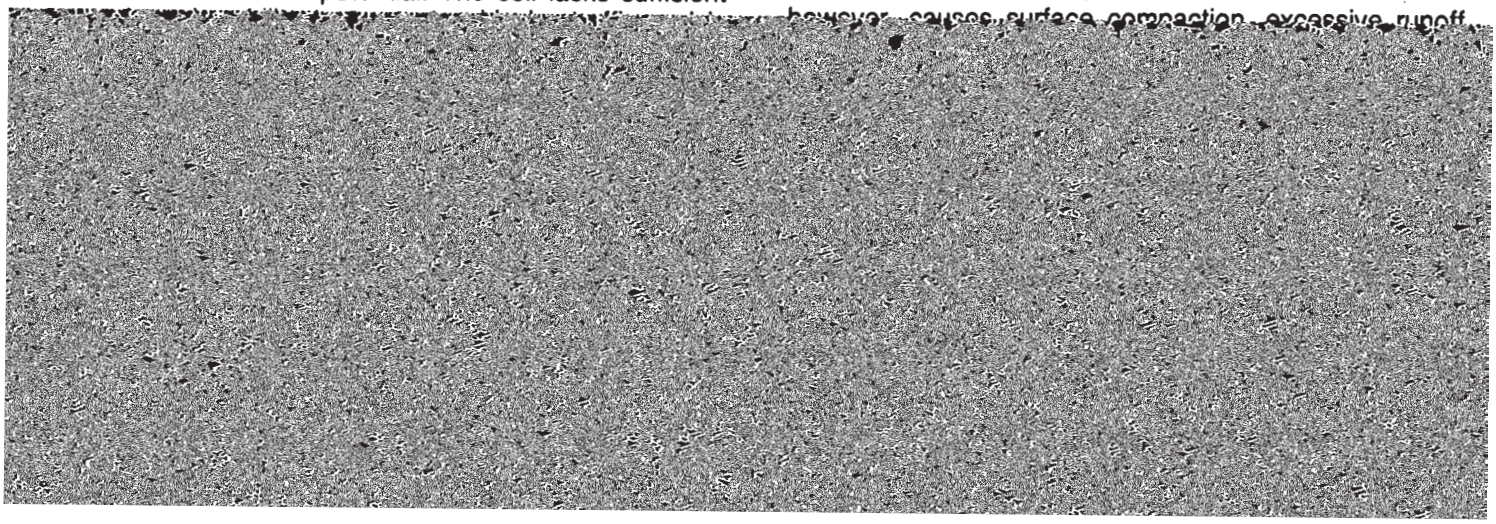
silty clay loam; the middle part is yellowish brown, mottled, firm silty clay loam; and the lower part is dark yellowish brown, firm clay loam. The substratum, to a depth of 60 inches, is yellowish brown, calcareous loam or slity clay loam. In some places, the subsoil is thinner and shallower to calcareous material than is typical. In areas where the upper part of the subsoil has been mixed with the former surface layer by plowing, the present surface layer is dark yellowish brown silty clay loam. In a few areas, the substratum is reddish loam or yellowish brown silt loam. In some places, this slope is well drained.

Included with this soil in mapping are small areas of moderately well drained Assumption soils. These soils are silty to a depth of about 30 inches over gray, clay loam buried soil. They are on convex positions along drainageways. Also included are small areas of somewhat poorly drained Flanagan soils in drainageways. These included soils make up 10 to 15 percent of the unit.

This Catlin soil has moderate permeability. Surface runoff from cultivated areas is medium and available water capacity is high. A seasonal high water table is at a depth of 3 to 6 feet in spring. The surface layer is about 3 percent organic matter. It is difficult to till when eroded. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is neutral to medium acid. The shrink-swell potential is moderate in the subsoil. The frost action potential is high. Root development is restricted below a depth of about 50 inches by compact, loamy glacial till.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, cover crops, contour farming, and terraces help prevent excessive soil loss (fig. 8). Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff,



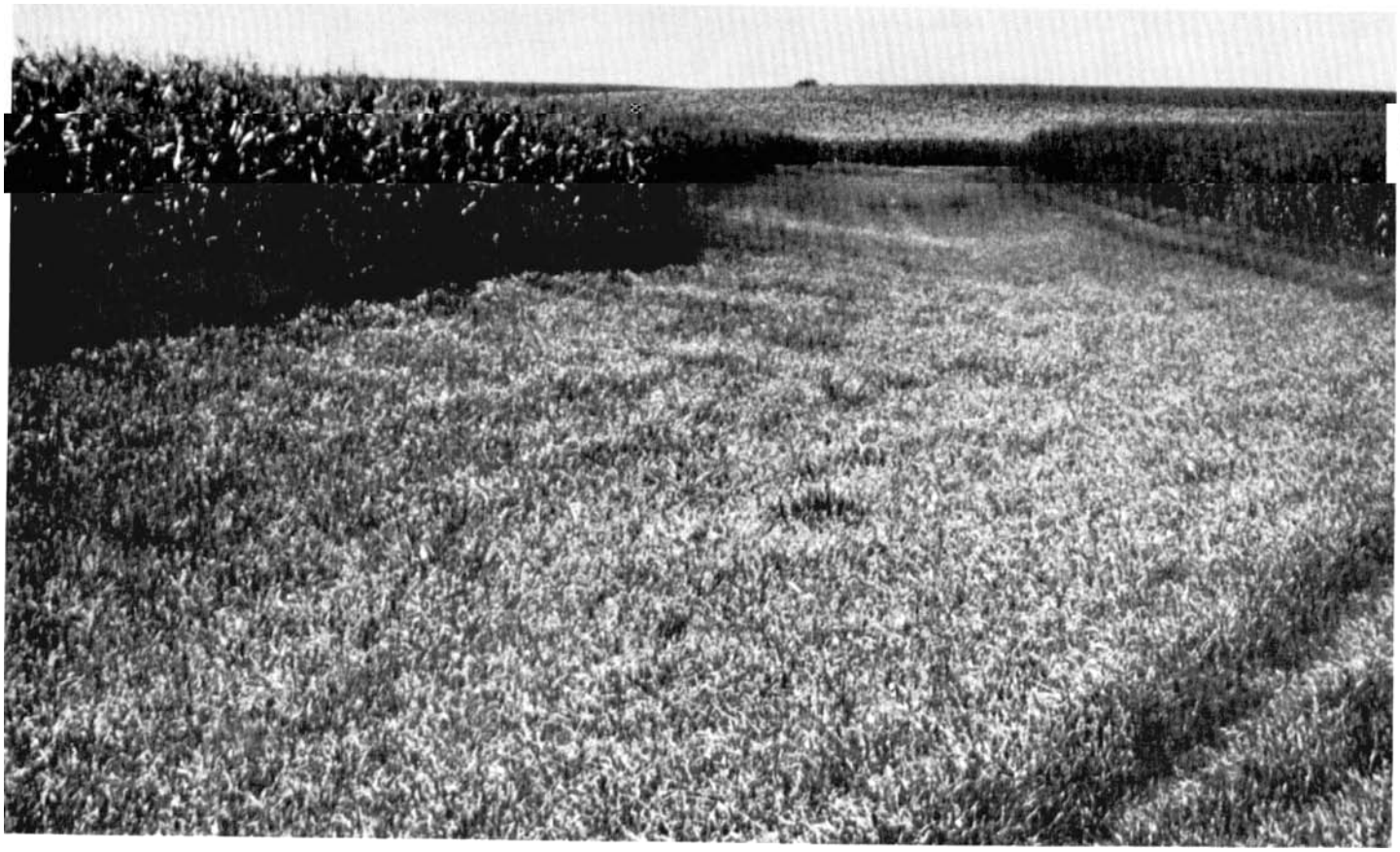


Figure 8.—Grassed waterway in Catlin silt loam, 5 to 10 percent slopes, eroded, helps prevent water erosion.

This gently sloping, well drained soil is on low ridges shaped like dunes that are on upland divides and stream terraces. Areas are irregular in shape and range from 2 to about 40 acres in size.

Typically, the surface layer is very dark gray, friable sandy loam about 5 inches thick. The subsoil is dark brown, dark yellowish brown, and yellowish brown sandy loam about 26 inches thick. The substratum, to a depth of 60 inches, is yellowish brown and yellow loamy sand and sand. In some places, the subsoil and substratum contain silty material. In some areas, the surface layer is thin and dark colored. In a few areas, the soil is sandier than is typical.

Included with this soil in mapping are small areas of somewhat poorly drained La Hogue and Millbrook soils. La Hogue and Millbrook soils are in shallow depressions

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. Soil blowing and water erosion are hazards. Minimum tillage, cover crops, and returning crop residue to the soil and regular additions of other organic material reduce soil erosion and increase water intake. Contour farming and stripcropping also help control soil blowing and water erosion and conserve moisture. Heavy fertilizer applications are generally not economical because crop growth is limited by low available water capacity. Early planting in spring reduces the effect of summer drought.

This soil is suited to woodland and a few small areas remain in woodland. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling

This soil is in capability subclass IIIe.

175C—Lamont sandy loam, 5 to 12 percent slopes. This sloping, well drained soil is on side slopes of ridges shaped like dunes and on uplands and on breaks of stream terraces. Areas are irregular in shape and range from about 2 to 25 acres in size.

Typically, the surface layer is dark grayish brown, friable sandy loam about 5 inches thick. The subsoil is dark yellowish brown sandy loam about 26 inches thick. The substratum, to a depth of 60 inches, is mottled, dark yellowish brown loamy sand and sand. In some places, the subsoil and substratum contain silty material. In some areas, the surface layer is thin and dark colored. In a few areas, the soil is sandier than is typical.

Included with this soil in mapping are small areas of somewhat poorly drained La Hogue and Millbrook. La Hogue and Millbrook soils are in drainageways, and they make up 2 to 10 percent of the unit.

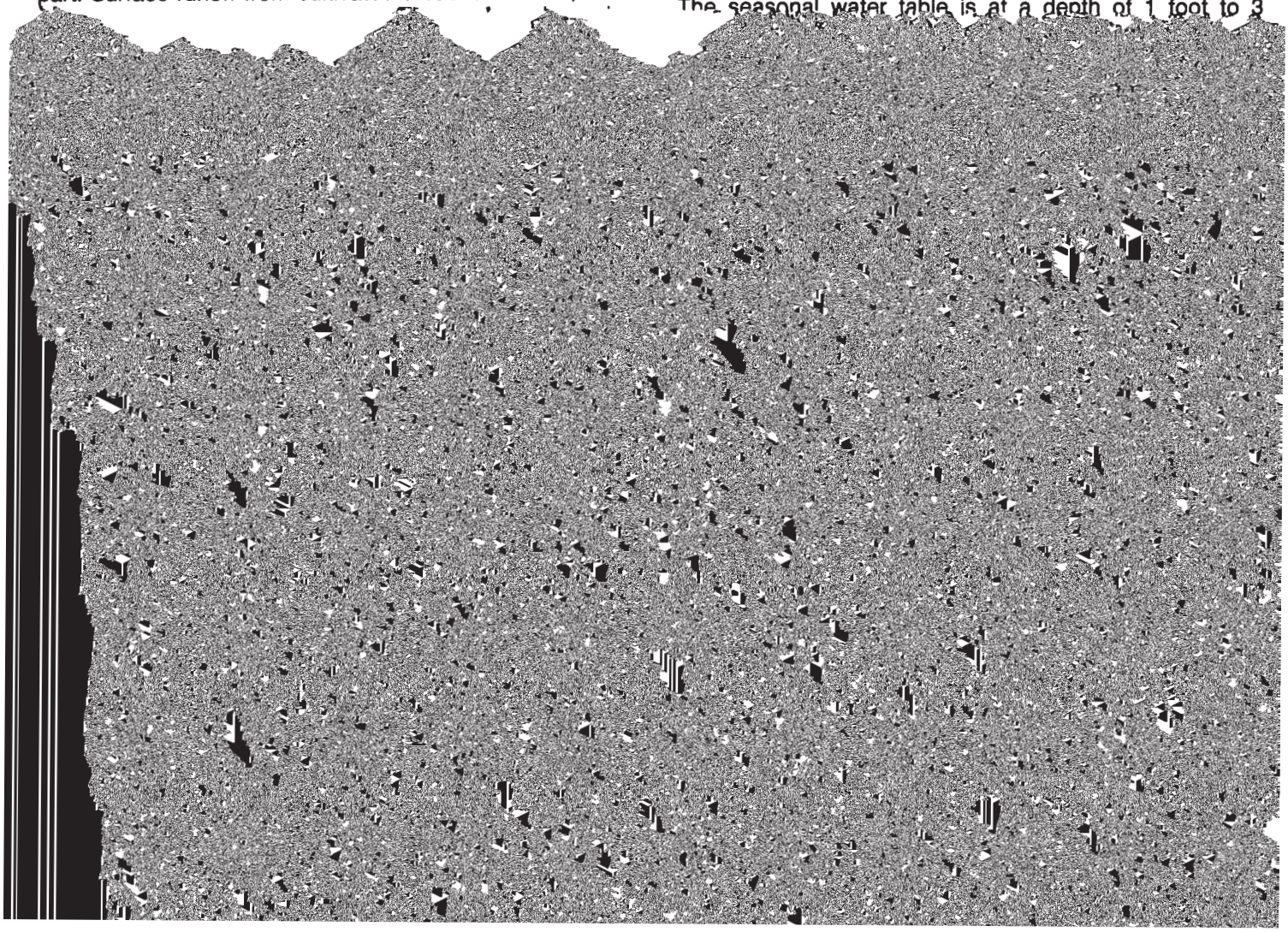
This Lamont soil has moderately rapid permeability in the upper part of the profile and very rapid in the lower part. Surface runoff from cultivated areas is medium, and

lands. Areas are irregular in shape and range from 2 to 150 acres in size.

Typically, the surface layer is black silt loam about 13 inches thick. The subsurface layer is very dark gray and dark grayish brown silt loam about 8 inches thick. The subsoil is about 38 inches thick. The upper part is mottled, dark grayish brown silty clay loam; the middle part is grayish brown silty clay loam; and the lower part is grayish brown loam. The substratum, to a depth of 70 inches, is mottled gray, dark gray, and yellowish brown gravelly sandy loam. In some places, the underlying sandy material is deeper than is typical. In a few areas the surface layer is thinner than is typical.

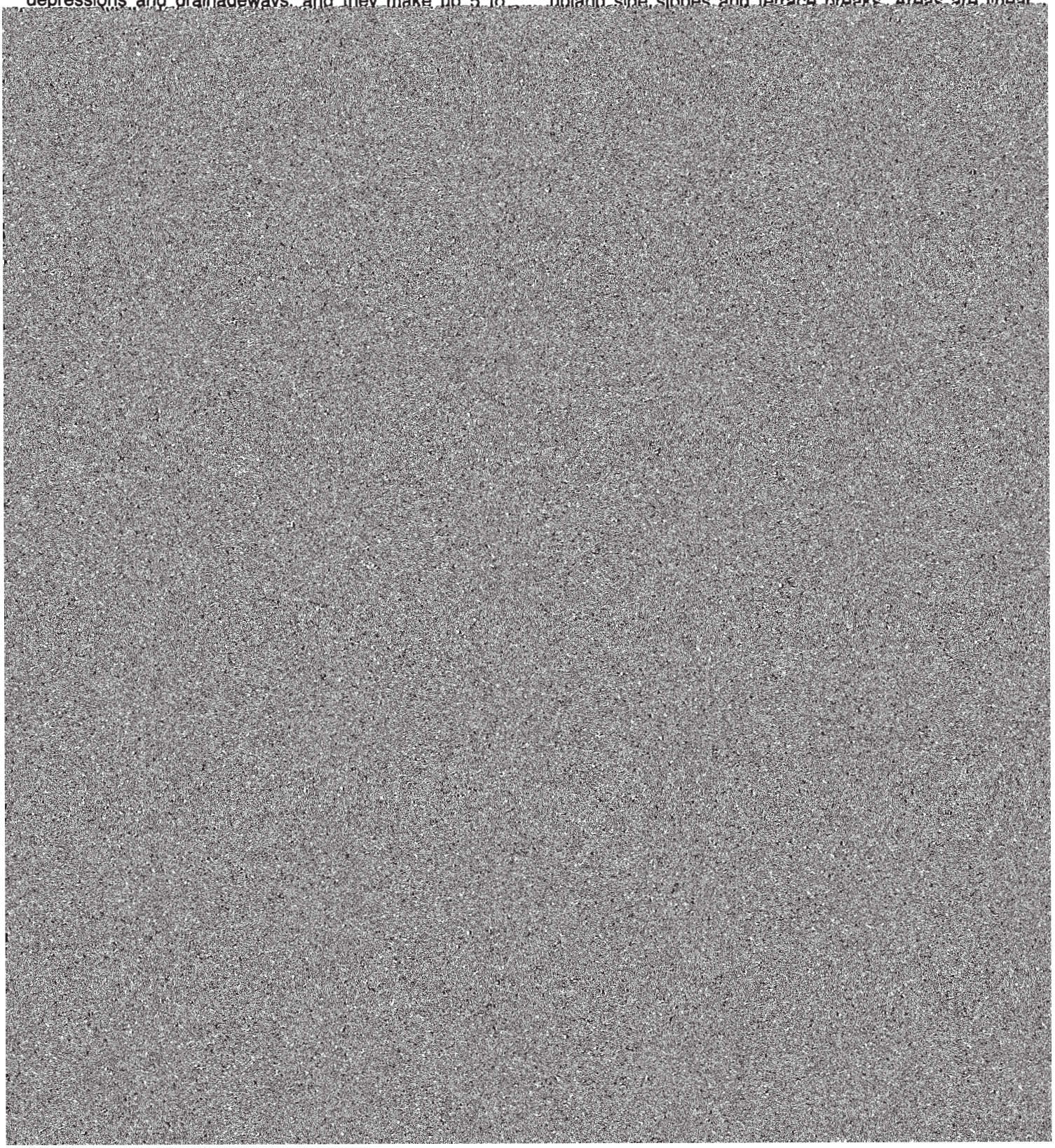
Included with this soil in mapping are small areas of poorly drained Drummer and Sable soils. Sable soils do not have sandy layers in the lower part of the subsoil. Sable and Drummer soils are saturated with water for longer periods than this Elburn soil. The included soils are in small depressions and make up 5 to 10 percent of the unit.

This Elburn soil has moderate permeability. Surface runoff is slow, and available water capacity is very high. The seasonal water table is at a depth of 1 foot to 3



Included with this soil are small areas of somewhat poorly drained Elburn soils. These soils are in shallow depressions and drainageways, and they make up 5 to

199C2—Plano silt loam, 5 to 10 percent slopes, eroded. This sloping, moderately well drained soil is on upland side slopes and terrace breaks. Areas are linear



and the lower part is dark yellowish brown and yellowish brown, mottled sandy loam. The substratum, to a depth of 64 inches, is dark yellowish brown sandy loam. In some places, the subsoil is sandier and in other places more clayey than is typical. Also in some places, the subsurface layer is mixed with the surface layer by plowing.

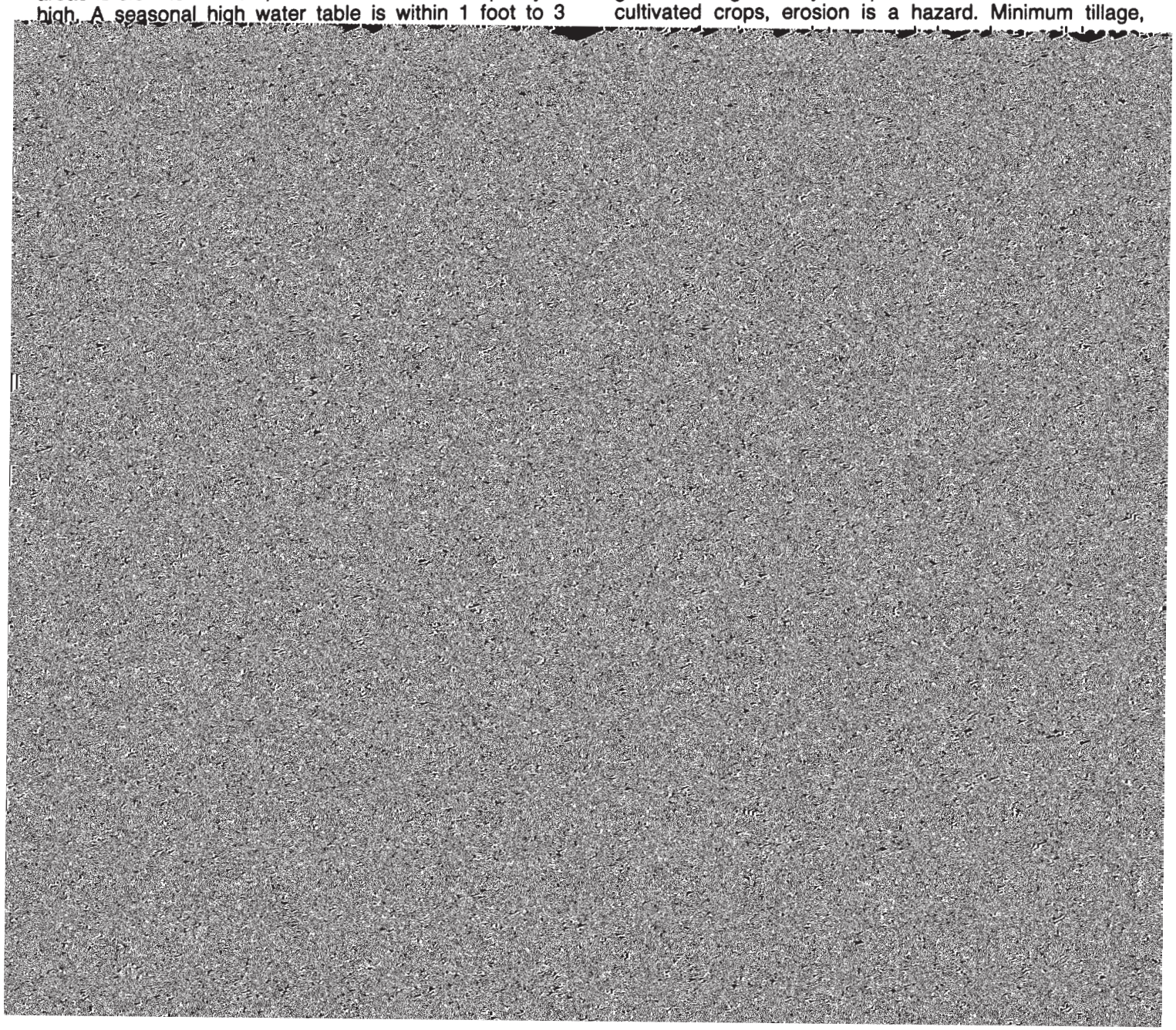
Included with this soil in mapping are small areas of poorly drained Drummer soils and well drained Jasper soils. These soils are in higher, convex areas and make up 2 to 10 percent of the unit.

This Millbrook soil has moderate permeability or moderately slow permeability. Surface runoff from cultivated areas is slow to medium, and available water capacity is high. A seasonal high water table is within 1 foot to 3

Selma soils. These soils are in shallow depressions and drainageways, and they make up 2 to 8 percent of the unit.

This Parr soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. The surface layer is about 3 percent organic matter. It crusts or puddles, especially if wet when worked. The surface layer generally is slightly acid, depending upon local liming. The subsoil is medium acid or slightly acid. The shrink-swell potential is moderate in the subsoil. Root development is restricted below a depth of about 28 inches by compact, loamy glacial till.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion is a hazard. Minimum tillage,



This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, terraces, and cover crops help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

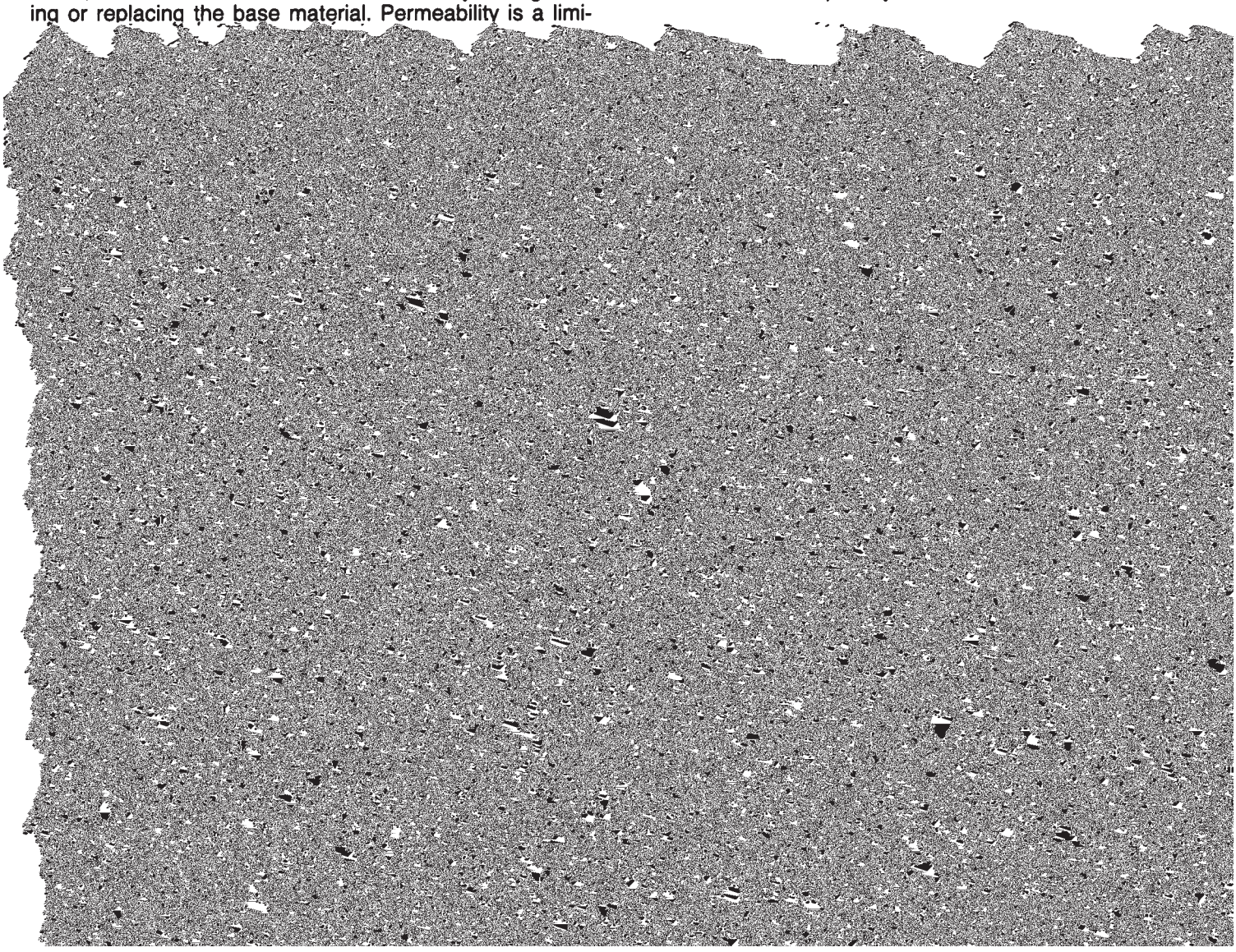
Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods, keep the pasture and soil in good condition.

This soil is suited to dwellings. Foundations can be designed to overcome the shrinking and swelling of the soil. Slopes require alteration in some places. The soil lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material. Permeability is a limi-

cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to dwellings without basements. Foundations can be designed to overcome the shrinking and swelling of the soil. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action, but these limitations can be corrected by strengthening or replacing the base material. The soil is poorly suited to septic tank absorption fields. The moderately slow and slow permeability and a seasonal high water table are limitations to septic tank absorption fields, but they can be overcome by increasing the size of the absorption fields and draining the perched water table.

This soil is in capability subclass IIe.



improves fertility, reduces crusting, and increases water infiltration.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is only moderately suited to dwellings without basements. Foundations can be designed to overcome the shrinking and swelling of the soil. Slopes require alteration in some places. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action, but this limitation can be corrected by strengthening or replacing the base material. The soil is poorly suited to septic tank absorption fields. The moderately slow and slow permeability and perched seasonal high water table are limitations for septic tank absorption fields, but they can be overcome by increasing the size of the absorption field and draining the water table.

This soil is in capability subclass IIIe.

233B—Birkbeck silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on convex ridgetops and broad, even side slopes. Areas are irregular in shape and range from 3 to 120 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 4 inches thick. The subsurface layer is brown or dark brown silt loam about 7 inches thick. The subsoil is about 37 inches thick. The upper part is dark brown or dark yellowish brown, friable silty clay loam; the middle part is mottled, yellowish brown and grayish brown, friable silty clay loam; and the lower part is yellowish brown, mottled, friable loam. The substratum, to a depth of 60 inches, is yellowish brown, calcareous loam. In some places, the subsoil is thicker and deeper to [illegible] than is typical. The substratum is

prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

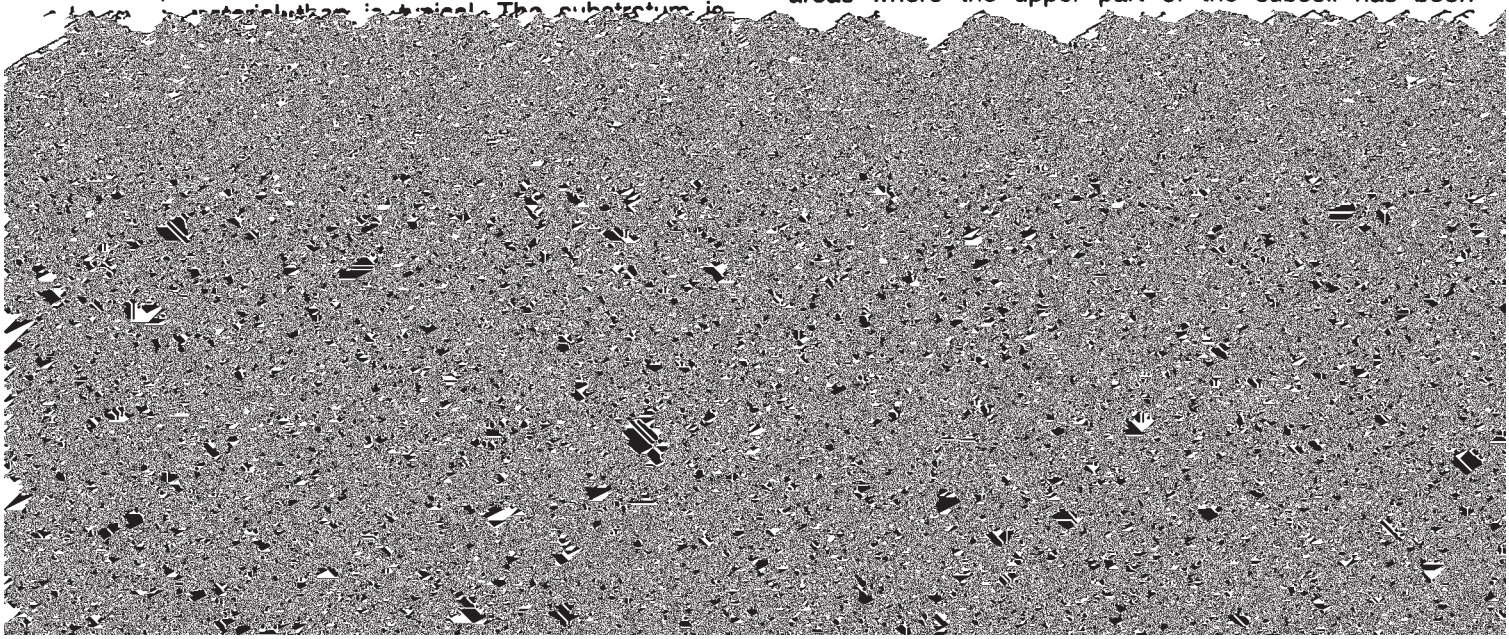
This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. There are few hazards or limitations to planting or harvesting trees.

This soil is only moderately suited to dwellings. Foundations can be designed to overcome the shrinking and swelling of the soil. If this soil is used for dwellings with basements, the water table needs to be lowered by subsurface drainage. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action, but these limitations can be corrected by strengthening or replacing the base material. The soil is poorly suited to septic tank absorption fields because of the seasonal high water table, which can be lowered by subsurface drainage.

This soil is in capability subclass IIe.

233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded. This sloping, moderately well drained soil is on convex ridgetops and knolls and on short, uneven side slopes. Areas are irregular in shape and range from 4 to 25 acres in size.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is about 34 inches thick. The upper part is dark brown or dark yellowish brown, friable silty clay loam; the middle part is dark brown, mottled, friable silty clay loam; and the lower part is yellowish brown, mottled, friable loam. The substratum, to a depth of 60 inches, is yellowish brown, moderately alkaline loam. In some places, the subsoil is thinner and shallower to calcareous material than is typical. Also, in areas where the upper part of the subsoil has been



cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting or girdling. Slope is the main limitation to planting or harvesting trees.

This soil is only moderately suited to dwellings. Foundations can be designed to overcome the shrinking and swelling of the soil. If the soil is used for dwellings with basements, the water table needs to be lowered by subsurface drainage. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action, but these limitations can be corrected by strengthening or replacing the base material. The soil is poorly suited to septic tank absorption fields because of the seasonal high water table, which can be lowered by subsurface drainage.

This soil is in capability subclass IIe.

rain and compacts if worked when wet. The subsoil is mildly alkaline to very strongly acid. The shrink-swell potential is moderate in the subsoil. The frost action potential is high.

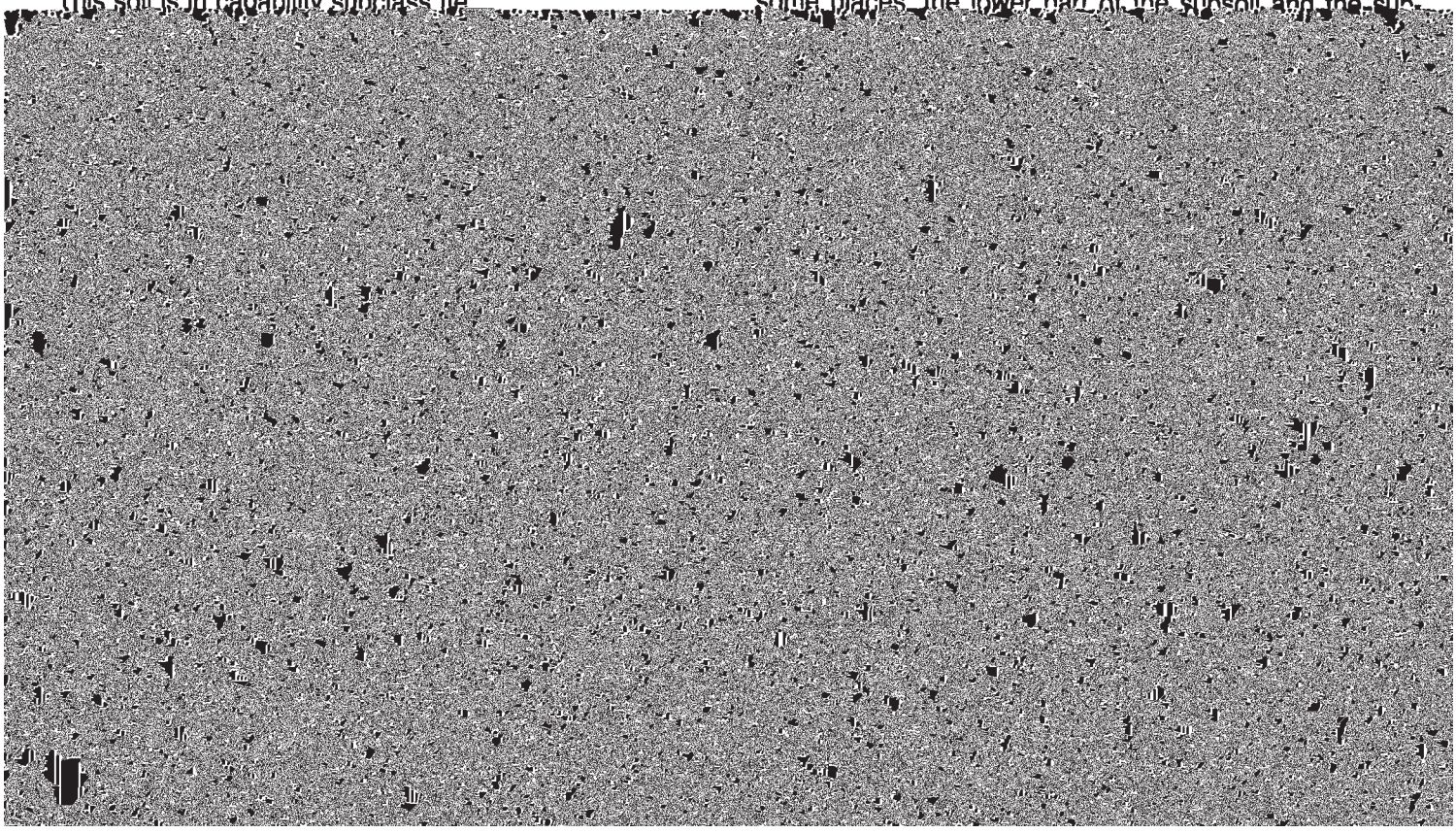
This soil is suited to corn, soybeans, small grain, and grass and legumes for hay and pasture. This soil can be artificially drained by subsurface drainage if suitable outlets are available. Returning crop residue to the soil or regular additions of other organic material maintains fertility and reduces crusting.

This soil is poorly suited to dwellings and septic tank absorption fields. Ths seasonal high water table can be lowered by subsurface drainage if adequate outlets are available. Frost action and soil strength severely affect streets and roads, but these limitations can be reduced by replacing base material.

This soil is in capability subclass IIw.

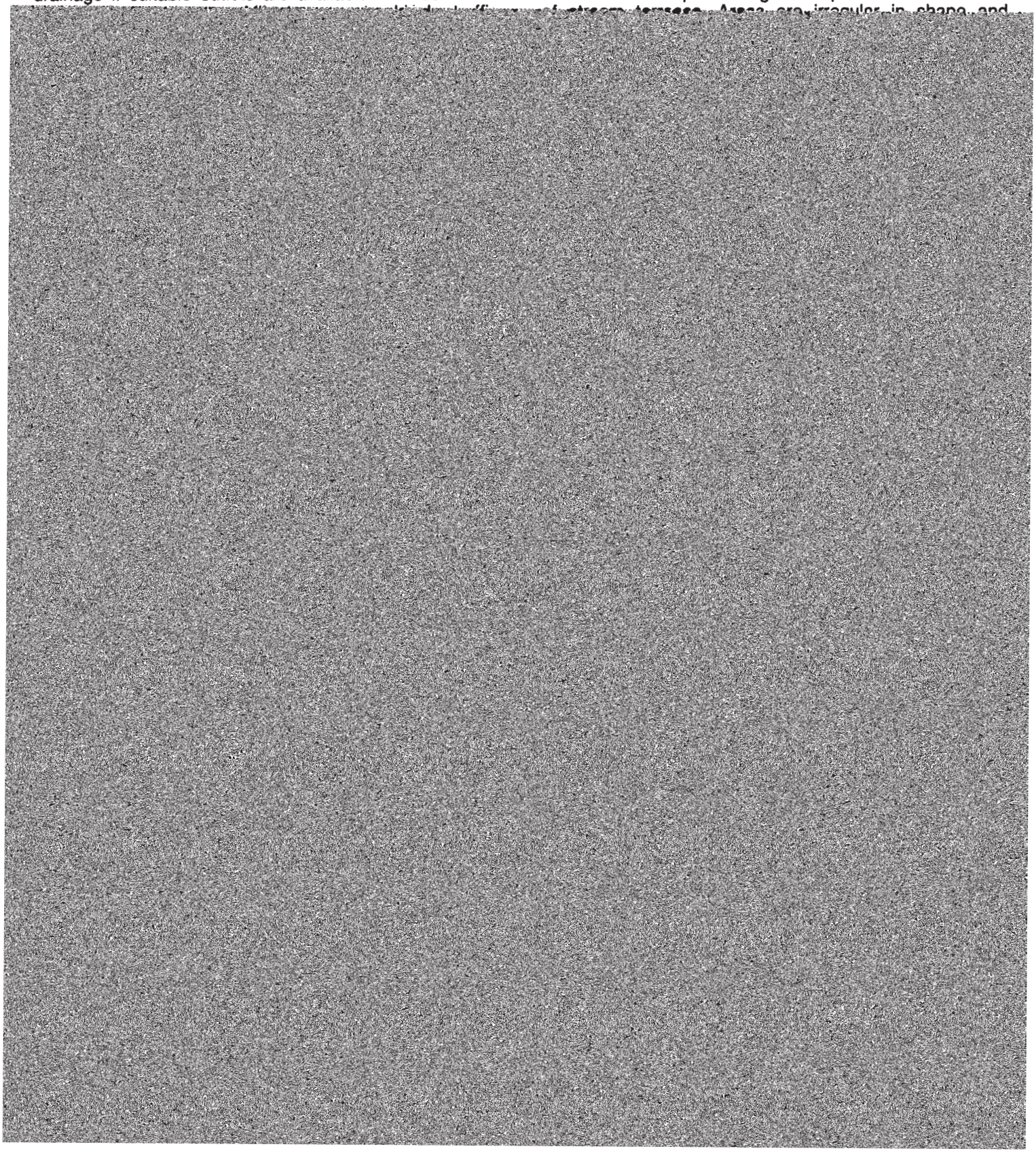
243A—St. Charles silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on divides and foot slopes of uplands and on stream terraces. Areas are irregular in shape and range from 2 acres to more than 100 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 5 inches thick. The subsurface layer is brown and yellowish brown, friable silt loam about 9 inches thick. The subsoil, to a depth of about 60 inches, is yellowish brown silty clay loam in the upper part and yellowish brown loam and silt loam in the lower part. In some places the lower part of the subsoil and the sub-



drainage if suitable outlets are available. The soil lacks

soil is on side slopes of ridges on uplands and on breaks



convex side slopes at the heads of upland drainageways. Areas are long and range from 2 to 20 acres in size.

Typically, the surface layer is very dark gray silt loam about 9 inches thick. The subsurface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 48 inches thick. The upper part is yellowish brown, friable silty clay loam and silt loam; the middle part is very dark gray and very dark grayish brown silty clay loam; and the lower part is mottled grayish brown and gray, friable clay loam. In some areas slope is less than 2 percent or more than 6 percent. In some areas, the surface layer is thicker, and in other places, the silty material is thicker than is typical. In some places, the upper part of the subsoil is loam or clay loam, or the lower part of the subsoil contains reddish colored glacial material.

Included with this soil in mapping are small areas of somewhat poorly drained Atterberry and Lawson soils. These soils are in shallow depressions and drainageways, and they make up 2 to 10 percent of the unit.

This Assumption soil has moderate permeability in the upper part and moderately slow permeability in the lower part. Surface runoff from cultivated areas is medium, and available water capacity is high. A perched seasonal high water table is at a depth of 3 to 4.5 feet. In wet years, seepage is a concern in spring. The surface layer is about 3.5 percent organic matter. It is friable but is difficult to till when wet. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is strongly acid. The shrink-swell potential is moderate in the subsoil. The frost action potential is high.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water intake.

This soil is only moderately suited to dwellings because of the shrinking and swelling of the soil and the seasonal high water table. Foundations can be designed to overcome the shrink-swell potential. The perched seasonal high water table is a limitation to dwellings with basements but can be overcome by installing subsurface drainage if suitable outlets are available.

This soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action, but these limitations can be corrected by strengthening or replacing the base material. The soil is poorly suited to septic tank absorption fields because of the moderately slow permeability in the lower part and the perched seasonal high water table; these limitations can be partly overcome by increasing the size of the absorption field and using subsurface drainage if suitable outlets are available.

This soil is in capability subclass IIe.

259C2—Assumption silt loam, 5 to 10 percent slopes, eroded. This sloping, moderately well drained soil is on convex side slopes at the heads of upland drainageways. Areas are linear or oblong in shape and range from 2 to 20 acres in size.

Typically, the surface layer is very dark gray and yellowish brown silt loam about 9 inches thick. The subsoil is about 54 inches thick. The upper part is yellowish brown, friable silty clay loam and silt loam; the middle part is very dark gray and very dark grayish brown silty clay loam; and the lower part is mottled, grayish brown and gray, friable clay loam. In some less eroded places, the surface layer is thicker. In places, the silty material is thicker than is typical. In some places, the upper part of the subsoil is loam or clay loam, or the lower part contains reddish colored glacial material.

Included with this soil in mapping are small areas of somewhat poorly drained Atterberry and Lawson soils. These soils are in shallow depressions and drainageways, and they make up 2 to 10 percent of the unit.

This Assumption soil has moderate permeability in the upper part and moderately slow permeability in the lower part. Surface runoff from cultivated areas is medium, and available water capacity is high. A perched seasonal high water table is at a depth of 3 to 4.5 feet. In wet years, seepage is a concern in spring. The surface layer is about 3 percent organic matter. It is difficult to till and crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is strongly acid. In addition, the shrink-swell potential is moderate in the subsoil. The frost action potential is high.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water intake.

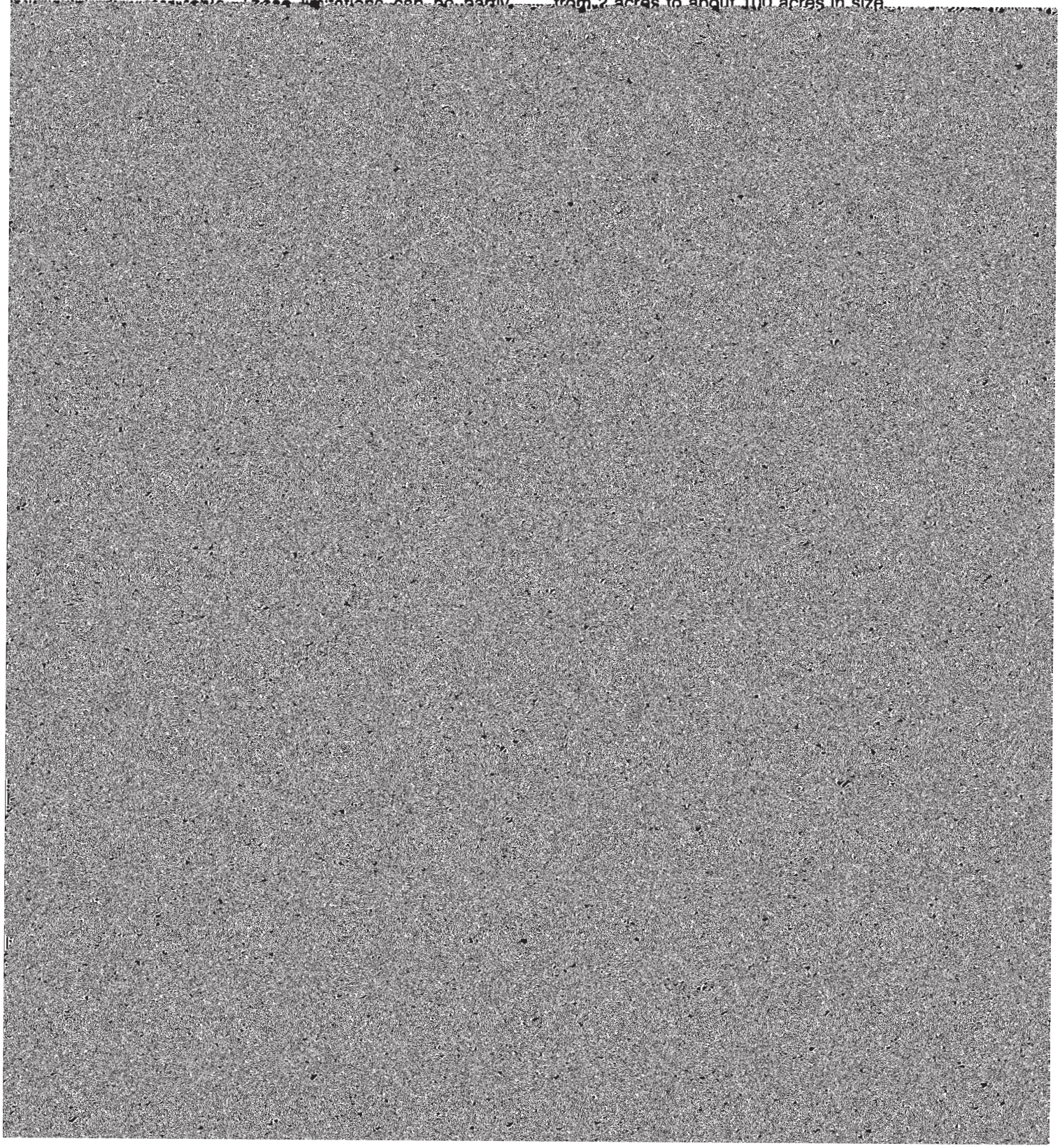
Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet causes surface compaction, excessive runoff, and poor tilth. Pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is only moderately suited to dwellings because it shrinks and swells and has a seasonal high water table. Foundations can be designed to overcome the shrink-swell potential. The perched seasonal high water table can be overcome by subsurface drainage if suitable outlets are available.

This soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action, but these limitations can be corrected by strengthening or replacing the base material. The soil is poorly suited to

septic tank absorption fields because of the moderately slow permeability in the lower part and the perched seasonal high water table. These limitations can be partly

drained soil is on broad divides of uplands and on stream terraces. Areas are irregular in shape and range from 2 acres to about 100 acres in size.



lower part is dark yellowish brown, yellowish brown, and brownish yellow silt loam. The substratum, to a depth of 60 inches, is brown, yellowish brown, and brownish yellow silt loam. In some places, gray mottles are at a depth of less than 30 inches. In some areas, stratified sandy material or clay loam glacial material is within 60 inches, and in some places, calcareous material is at a depth of less than 40 inches. In some places, the soil is moderately well drained.

Included with this soil in mapping are small areas of somewhat poorly drained Atterberry and Stronghurst soils. These soils are in shallow depressions and drainageways, and they make up 2 to 5 percent of the unit.

This Fayette soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is very high. The surface layer is about 2 percent organic matter. It crusts or puddles after hard rain. The subsoil is medium acid or strongly acid. The shrink-swell potential is moderate in the subsoil and underlying material. The frost action potential is high.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If this soil is used for cultivated crops, erosion is a hazard. Minimum tillage, contour farming, and cover crops help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation, or spraying, cutting, or girdling.

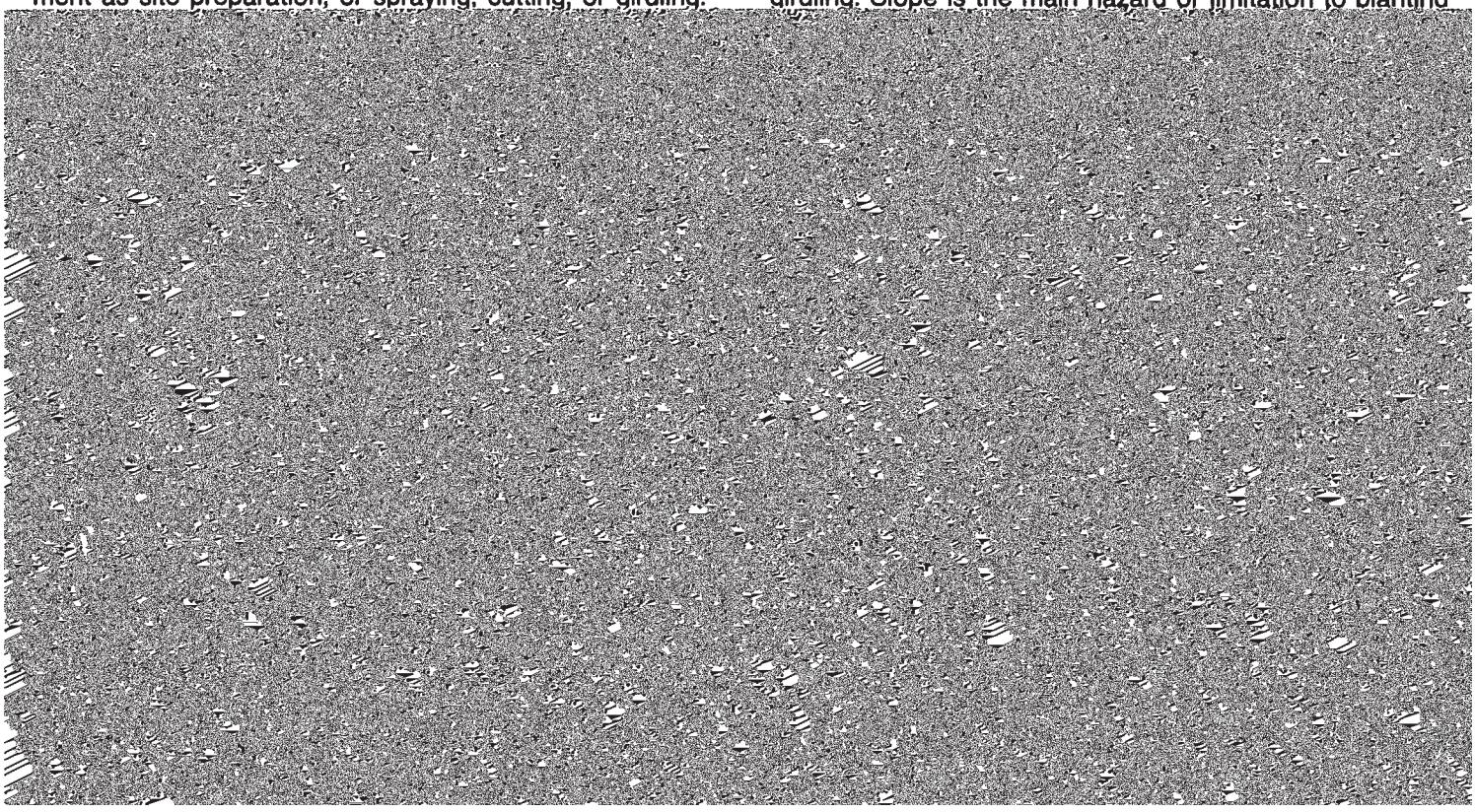
material, or bedrock is within a depth of 60 inches, and in some places, calcareous material is at a depth of less than 40 inches. In some areas, slope is more than 10 percent. In some places, the soil is moderately well drained.

Included with this soil in mapping are small areas of somewhat poorly drained Atterberry and Stronghurst soils and poorly drained Comfrey soils. These soils are in drainageways and finger into the Fayette soils. They make up 5 to 10 percent of the unit.

This Fayette soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is very high. The surface layer is about 1.5 percent organic matter. It is difficult to work, and it crusts or puddles after hard rain. The subsoil is medium acid or strongly acid. The shrink-swell potential is moderate in the subsoil and underlying material. The frost action potential is high.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. Erosion is a continuing hazard. Minimum tillage combined with contour farming or terracing allow intensive cropping systems while keeping soil losses within acceptable limits. Using cover crops and returning crop residue to the soil and making regular additions of other organic material maintain fertility and reduce crusting and erosion.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting



bedrock is within a depth of 60 inches, or calcareous material is at a depth of less than 40 inches. In some areas, slope is more than 15 percent, or the soil is moderately well drained.

Included with this soil in mapping are small areas of somewhat poorly drained Atterberry and Stronghurst soils and poorly drained Comfrey soils. These soils are in drainageways and finger into the Fayette soils. They make up 5 to 10 percent of the unit.

This Fayette soil has moderate permeability. Surface runoff from cultivated areas is rapid, and available water capacity is very high. The surface layer is about 1.5 percent organic matter. It is difficult to work. It crusts or puddles after hard rain. The subsoil is medium acid or strongly acid. In addition, the shrink-swell potential is moderate in the subsoil and in the underlying material. The frost action potential is high.

Some areas of this soil are cultivated. The soil is moderately suited to row crops, hay, and pasture, but it is well suited to woodland. It is moderately suited to dwellings and septic tank absorption fields.

If this soil is used for cultivated row crops or grain, erosion is a continuing hazard. Minimum tillage, combined with contour farming or terracing, allows intensive cropping systems and keeps soil losses within acceptable limits. Planting cover crops and returning crop residue to the soil and making regular additions of other organic material improve fertility and reduce crusting and erosion.

This soil is suited to woodland. A few areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting or harvesting trees.

Using this soil for pasture or hay effectively controls erosion. Proper stocking, pasture rotation, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is suited to dwellings, but foundations need to overcome the shrinking and swelling of the soil. The slope may require alteration also. The soil lacks sufficient strength for vehicular traffic and is limited by frost action. Strengthening or replacing the base material helps overcome these limitations to roads and streets. Placing septic tank absorption fields on the contour helps overcome the limitation of slope.

This soil is in capability subclass IIIe.

290B—Warsaw loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on convex ridges on outwash plains, gravelly kames, and terraces of streams and rivers. Areas are irregular in shape and range from 2 to 80 acres in size.

Typically, the surface layer is very dark brown loam upper part is dark yellowish brown, friable sandy loam and sandy clay loam; the lower part is yellowish brown sandy clay loam and sandy loam. The substratum, to a depth of about 60 inches, is yellowish brown, moderately alkaline sand and gravel. In places, the subsoil is thicker and deeper to sand and gravel than is typical. In a few areas, the surface layer is very dark gray sandy loam or loamy sand.

Included with this soil in mapping are small areas of well drained Jasper soils. These soils are in similar positions on the landscape, and they make up 2 to 4 percent of the unit.

This Warsaw soil has moderate permeability in the upper part and very rapid permeability in the lower part. Surface runoff from cultivated areas is medium, and available water capacity is moderate. The surface layer is about 3 percent organic matter. The subsoil is medium acid to moderately alkaline. Root development is restricted by calcareous sand and gravel below a depth of about 36 inches.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. Winter cover crops help prevent excessive soil blowing.

This soil is suited to dwellings and septic tank absorption fields. The very rapidly permeable underlying material creates a pollution hazard for shallow underground aquifers if the soil is used for onsite sewage disposal. This soil is well suited as a source of sand, gravel, and topsoil.

This soil is in capability subclass IIe.

294B—Symerton loam, 1 to 5 percent slopes. This nearly level to gently sloping, well drained soil is in rounded and slightly higher parts of till plains. Areas are irregular in shape and range from 2 to 80 acres in size.

Typically, the surface layer is very dark brown loam about 10 inches thick. The subsurface layer is very dark grayish brown loam about 7 inches thick. The subsoil is about 36 inches thick. The upper part is dark yellowish brown sandy clay loam, the middle part is yellowish brown silty clay loam, and the lower part is yellowish brown clay loam. The substratum, to a depth of 60 inches, is light yellowish brown, moderately alkaline clay loam. In some places, the subsoil is thicker and deeper to calcareous silty clay loam than is typical. In other areas, the subsoil is thinner and shallower to calcareous silty clay loam than is typical. In a few areas, sandy layers are below a depth of 40 inches.

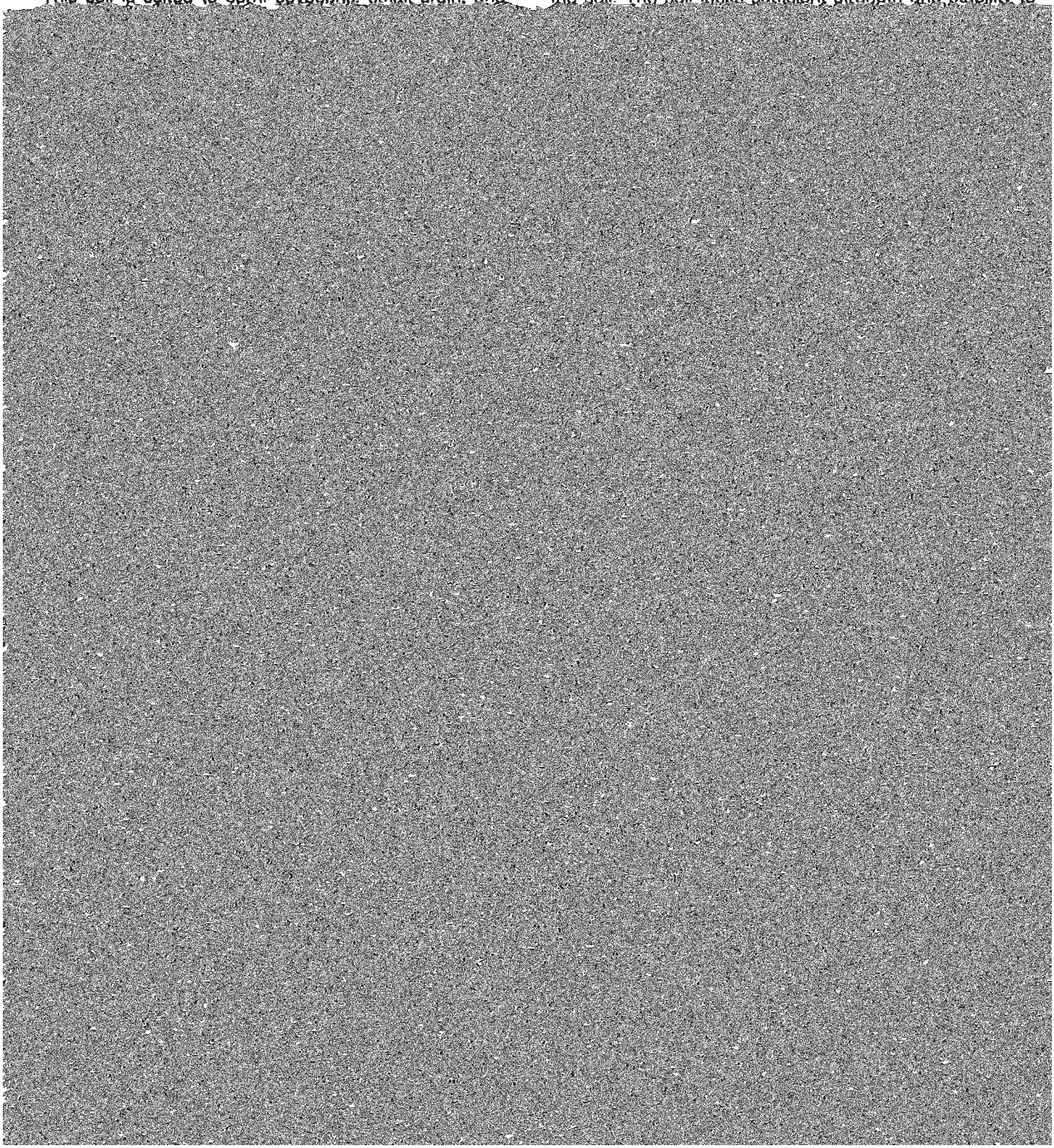
Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue soil. This soil is on slightly lower parts of the landscape, and it makes up 10 to 15 percent of the unit.

This Symerton soil has moderate permeability in the upper part of the subsoil and moderately slow in the lower part. Surface runoff is medium, and available water

shrink-swell potential is moderate in the subsoil and underlying material.

This soil is suited to corn, soybeans, small grain, and

This soil is suited to dwellings, but foundations need to be designed to overcome the shrinking and swelling of the soil. The soil lacks sufficient strength and stability to



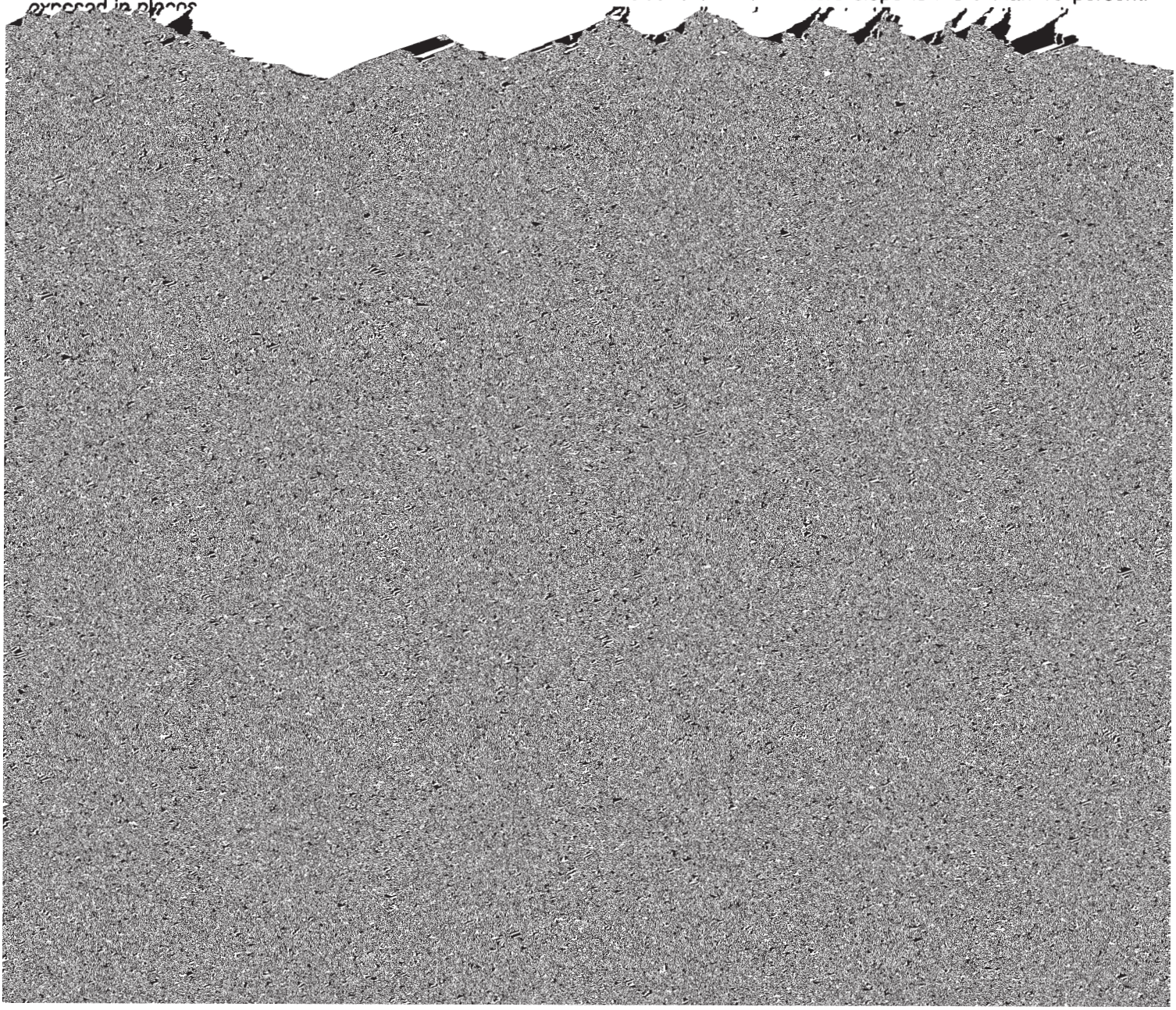
This soil is in capability subclass IIw.

324B—Ripon silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridgetops, knolls, and short side slopes. Areas are irregular in shape and range from 4 to 40 acres in size.

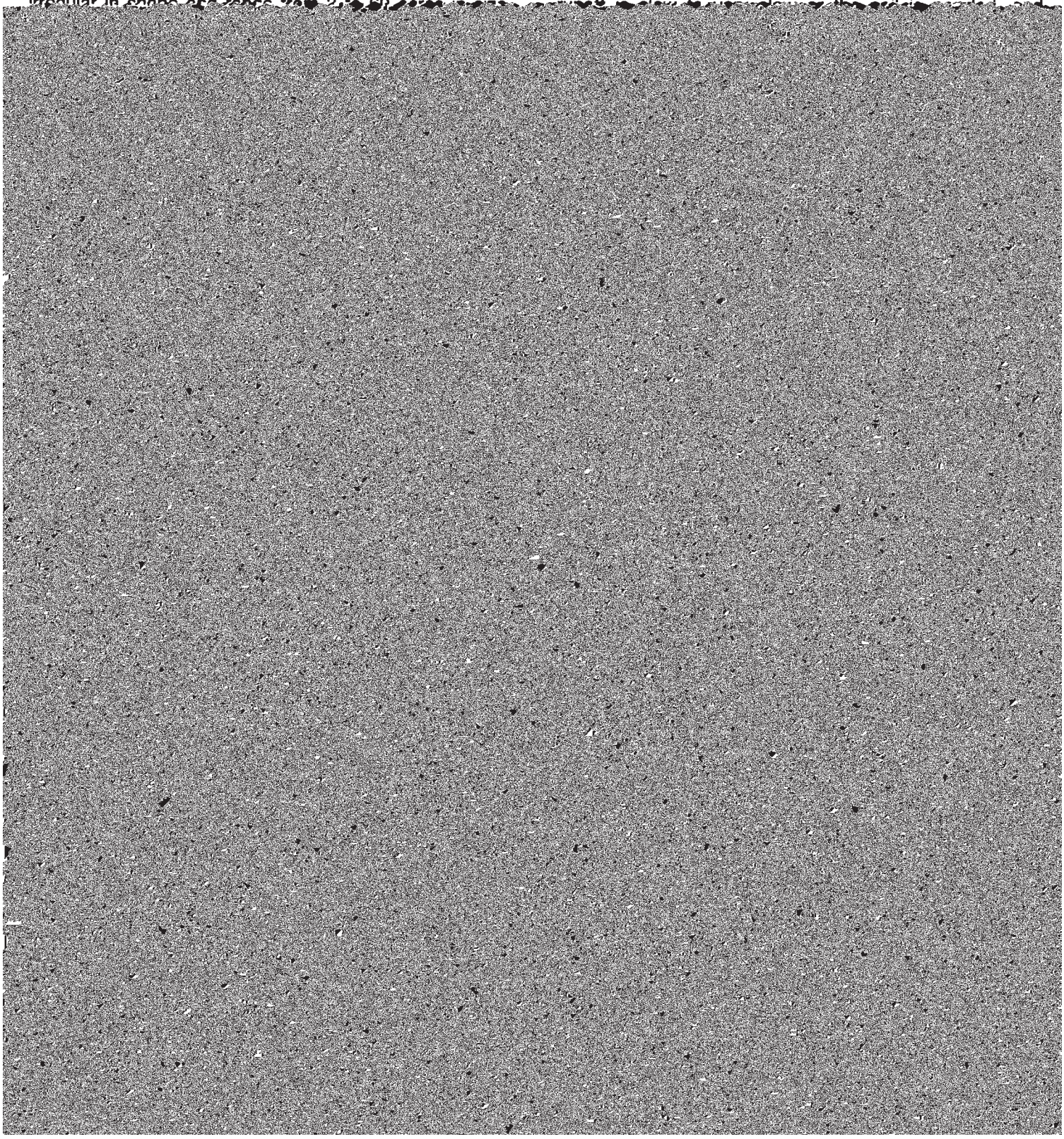
Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsurface layer is dark brown silt loam about 4 inches thick. The subsoil is silty clay loam about 24 inches thick. The upper part is dark brown, and the lower part is dark yellowish brown and friable. Limestone bedrock is at a depth of about 35 inches. In places, the subsoil is thicker than is typical and deeper to bedrock. The bedrock crops out and is exposed in places.

inches thick. The upper part is dark brown, friable silty clay loam; the middle part is dark yellowish brown silty clay loam; and the lower part is dark yellowish brown, friable clay loam. Limestone bedrock is at a depth of about 31 inches. In places, the subsoil is thicker and deeper to bedrock than is typical. In areas where the upper part of the subsoil has been mixed with the former surface soil by plowing, the present surface layer is dark yellowish brown silty clay loam. The bedrock is exposed in places.

Included with this soil in mapping are small areas of well drained Plano soils. These soils have a layer of outwash to a depth of 60 inches over bedrock. Also included are soils where slope is more than 10 percent.



327B—Fox loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on convex ridges on outwash plains, gravelly kames, and stream terraces. Areas are irregular in shape and range from 2 to 60 acres in size.



are at slightly higher elevations on the landscape and make up 2 to 10 percent of the unit.

This Canisteo soil has moderate permeability. Surface

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. There are few hazards or limitations to planting or harvesting trees.

This soil is suited to dwellings and septic tank absorption fields, but foundations need to be designed to overcome the shrinking and swelling of the soil. Damage from soil strength and frost action to streets and roads can be reduced by replacing the base material.

This soil is in capability subclass IIe.

361C2—Kidder loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on narrow, convex ridgetops and upper parts of side slopes. Areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface layer is dark brown loam about 5 prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

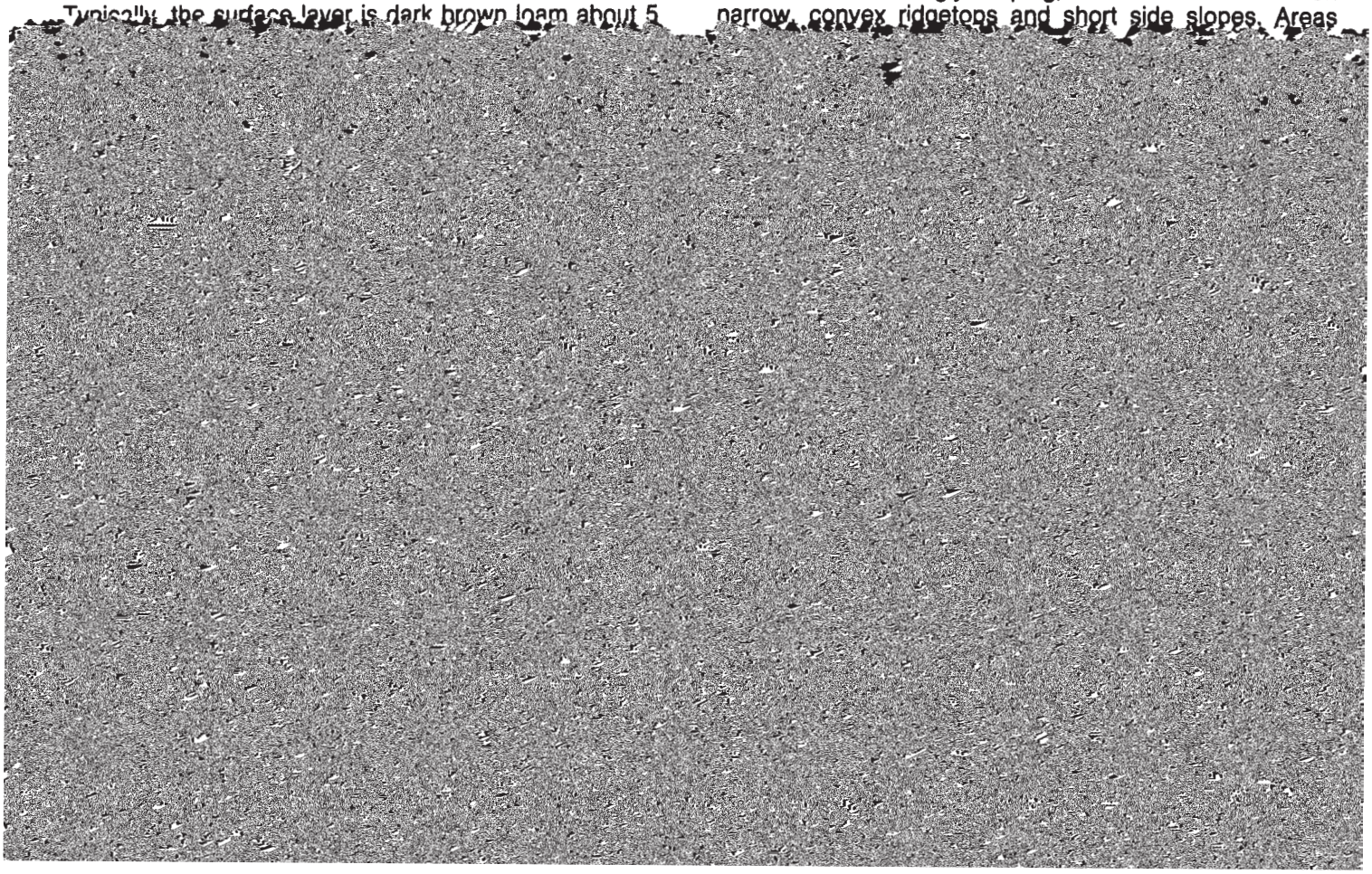
This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting or harvesting trees.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too dry, however, causes plants to die. Rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is only moderately suited to dwellings and is well suited to septic tank absorption fields, but foundations should be designed to overcome the shrinking and swelling of the soil. Frost action and soil strength limit the construction of local streets and roads, but these limitations can be overcome by replacing the base material.

This soil is in capability subclass IIIe.

361D2—Kidder loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on narrow, convex ridgetops and short side slopes. Areas



further erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting or harvesting trees.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is moderately suited to dwellings and septic tank absorption fields, but foundations need to be designed to overcome the shrinking and swelling of the soil. The soil lacks sufficient strength and stability to

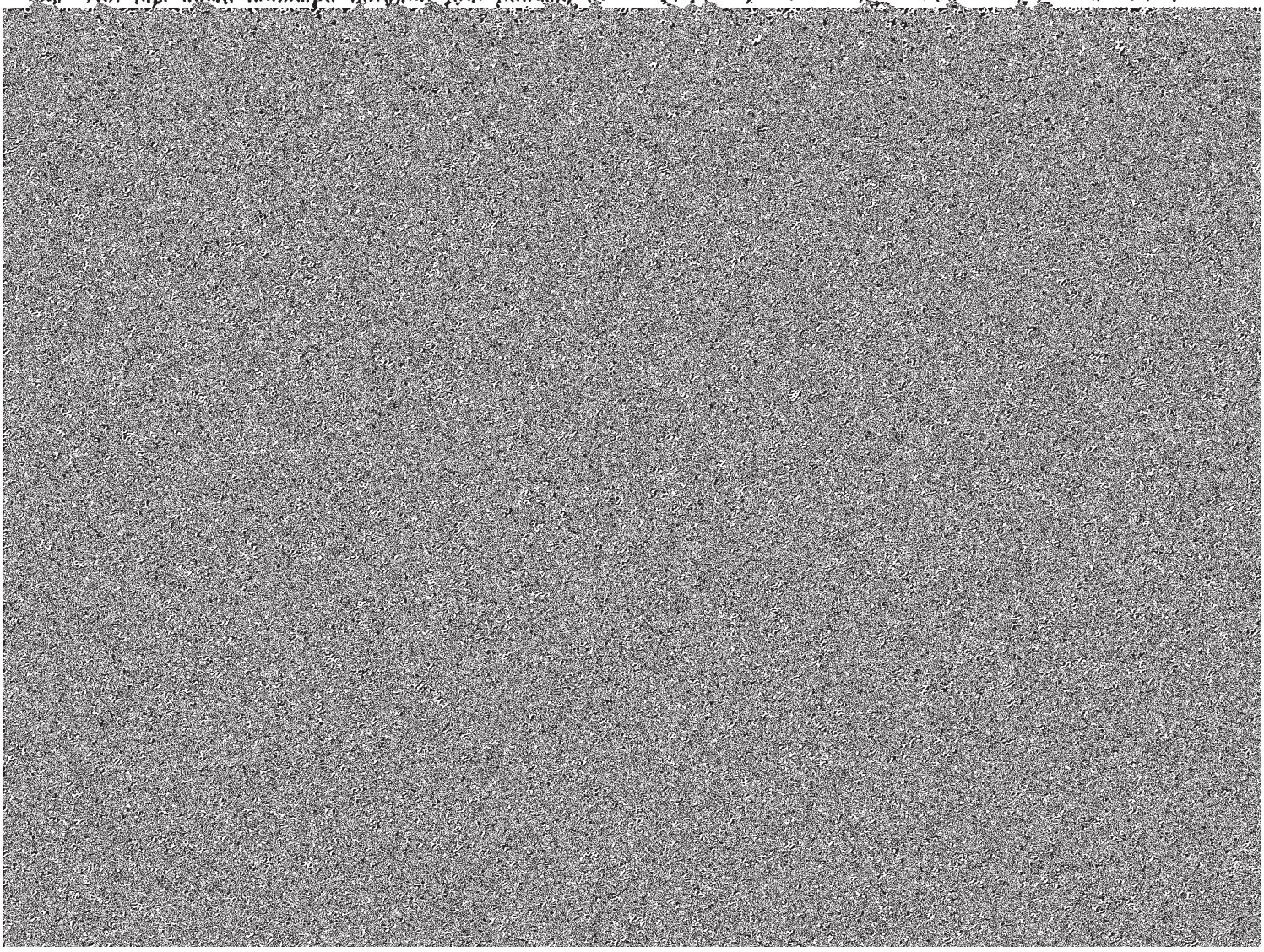
This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is well suited to dwellings and septic tank absorption fields.

This soil is in capability subclass IIe.

363C2—Griswold loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on narrow, convex ridgetops and upper side slopes. Areas are irregular in shape and range from 5 to 75 acres in size.

Typically, the surface layer is very dark brown loam about 7 inches thick. The subsurface layer is very dark grayish brown loam about 4 inches thick. The subsoil is about 18 inches thick. The upper part is dark brown,



This soil is in capability subclass IIIe.

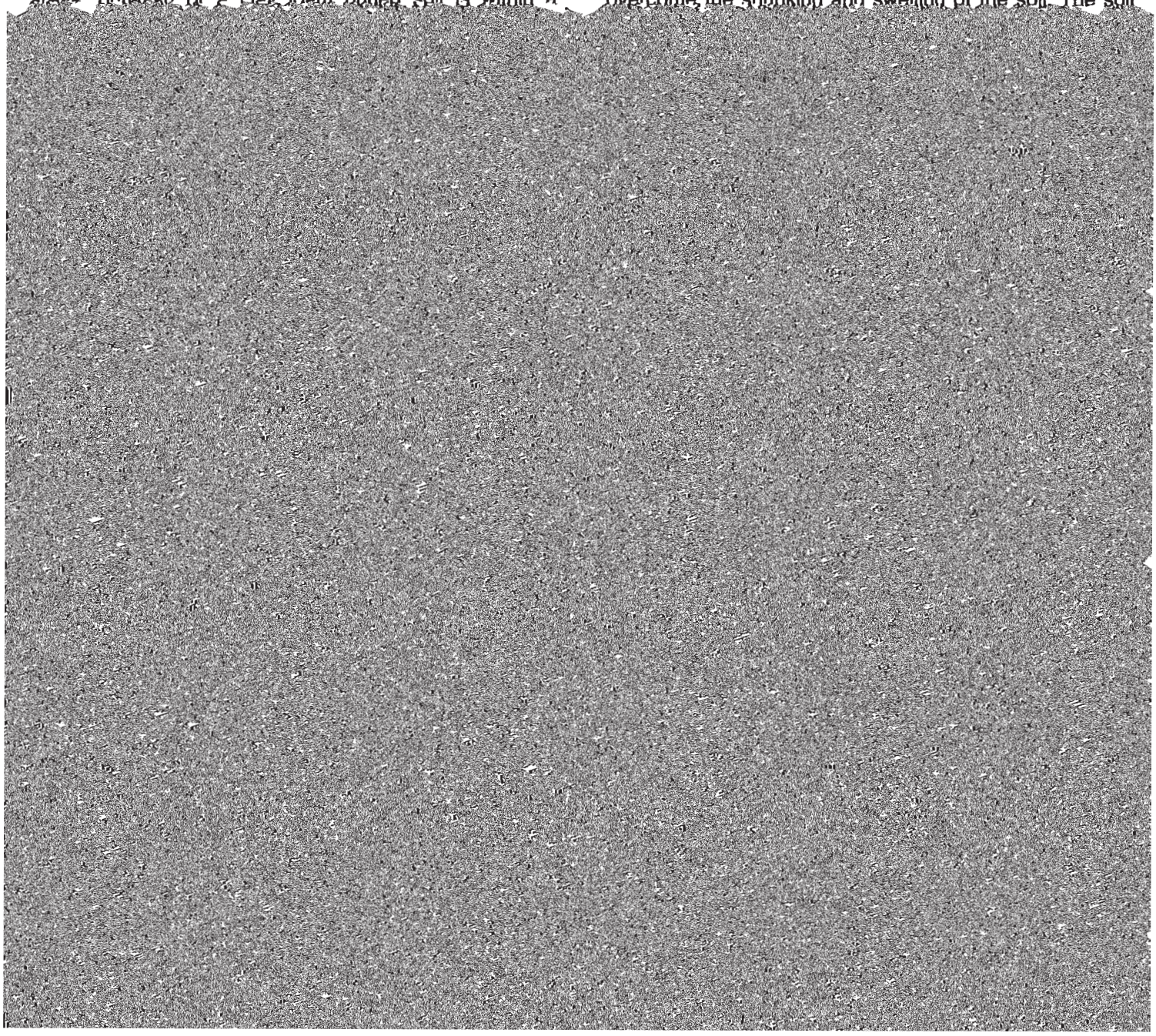
386A—Downs silt loam, 0 to 2 percent slopes. This nearly level, well drained soil is on ridges and broad divides of uplands. Areas are irregular in shape and range from 4 to 150 acres in size.

Typically, the surface layer is very dark gray silt loam about 7 inches thick. The subsoil is about 53 inches thick. The upper part is dark brown, friable silty clay loam; the middle part is yellowish brown, friable silty clay loam; and the lower part is yellowish brown silt loam. In places, the surface is thicker than is typical. In some areas, outwash or a clay loam buried soil is within a

shrink-swell potential is moderate in the subsoil. The frost heave potential is high.

This soil is suited to corn, soybeans, small grain, grass, legumes, and pasture. Erosion is a hazard if the soil is used for cultivated crops. Minimum tillage keeps soil losses to a minimum; reduces soil compaction and formation of a tillage pan; improves soil aeration, permeability, and tilth; and conserves moisture. Terraces, contour farming, and grass waterways also can be used to reduce soil losses.

This soil is suited to dwellings. The shrink-swell potential is a limitation, but foundations can be designed to overcome the shrinking and swelling of the soil. The soil



This soil is in capability class I.

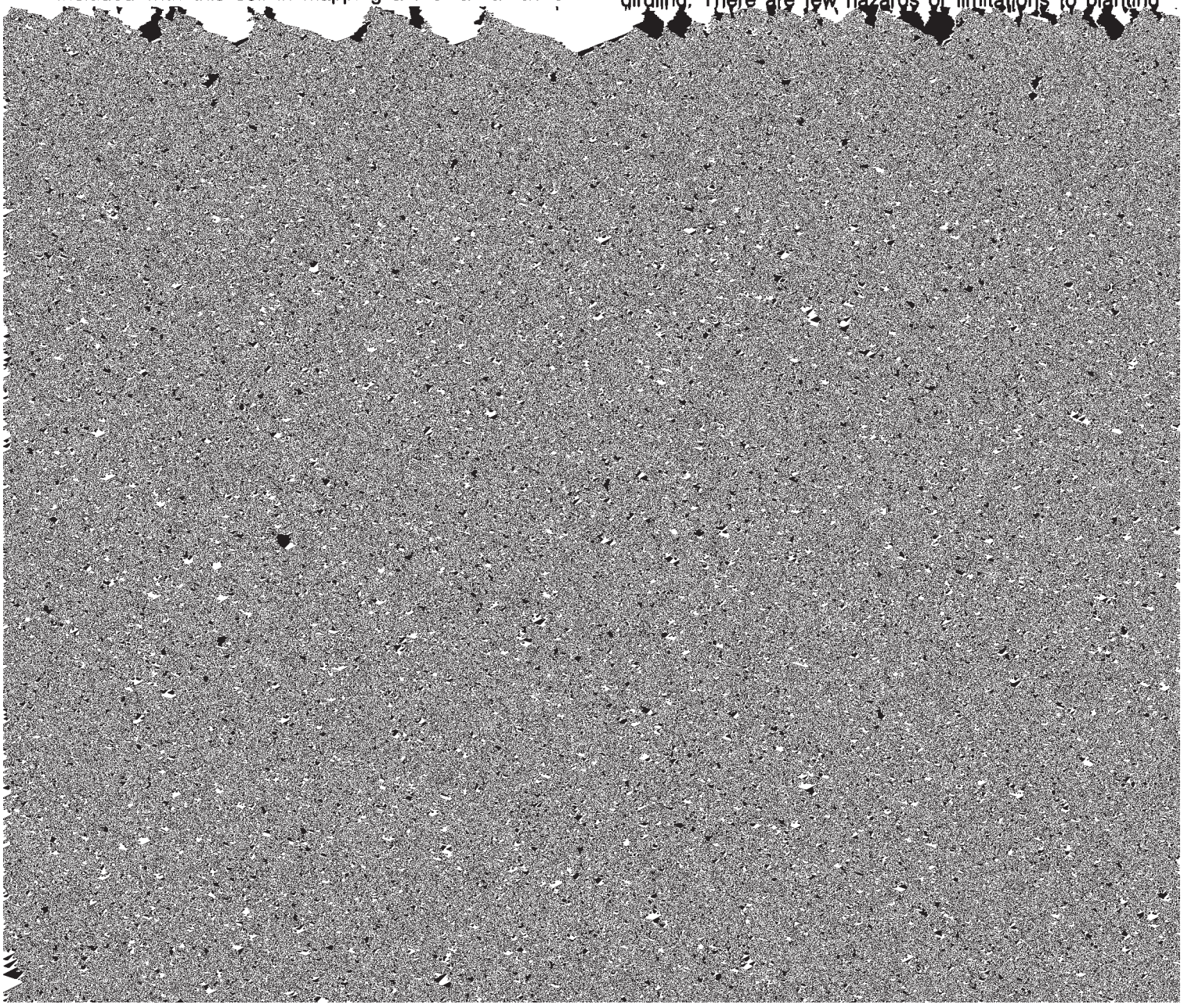
387B—Ockley silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on broad, high terraces of major river valleys. Areas are linear in shape and range from 2 to 100 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsoil is about 46 inches thick. The upper part is dark yellowish brown silty clay loam; the middle part is dark brown clay loam, and the lower layer is dark brown gravelly clay loam. The substratum, to a depth of 60 inches, is yellowish brown sand and gravel. In places, this soil is deeper to gravel than is typical.

Included with this soil in mapping are small areas of material extends to a depth of 60 inches. In Martinsville soils, loamy material extends to a depth of 60 inches. These soils are in similar positions on the landscape, and they make up 10 to 15 percent of the unit.

This Boone soil has rapid permeability. Surface runoff from cultivated areas is medium, and available water capacity is very low. The surface layer is about 0.5 percent organic matter. The subsoil is strongly acid. Root development is restricted below a depth of about 34 inches by sandstone bedrock.

This soil is moderately suited to woodland. Many areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. There are few hazards or limitations to planting



management practices as returning crop residue to the soil.

This soil is only moderately suited to dwellings without basements. The slope is a limitation, and the depth to bedrock makes alteration difficult. Adequate vegetative cover is difficult to maintain on this soil. The soil is poorly suited to septic tank absorption fields. Effluent from septic tank absorption fields can contaminate ground water supplies because of seepage into the sandstone bedrock. Slope is also a limitation.

This soil is in capability subclass VIs.

397F—Boone sand, 15 to 45 percent slopes. This moderately steep to very steep, excessively drained soil is on ridgetops and short side slopes. Areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is dark brown sand about 2 inches thick. The substratum, to a depth of 34 inches, is light yellowish brown sand over weathered sandstone. In places, the surface layer and subsurface layer are thicker or may be absent. Also, in some areas, slope is less than 15 percent.

Included with this soil in mapping are small areas of Chelsea, Martinsville, and Whalan soils. Whalan soils are loamy to a depth of about 30 inches to limestone bedrock. In Chelsea soils, sandy material extends to a depth of 60 inches and the surface layer is light colored. In Martinsville soils, loamy material extends to a depth of 60 inches. These soils make up about 10 to 15 percent of the unit.

This Boone soil has rapid permeability. Surface runoff is rapid, and available water capacity is very low. The surface layer is about 0.5 organic matter. The subsoil is strongly acid. Root development is restricted below a depth of about 34 inches by sandstone bedrock.

places, the depth to gravel is more than 60 inches. In a few small areas, the surface layer is light colored.

This Wea soil has moderate permeability in the subsoil and very rapid permeability in the substratum. Surface runoff is slow from cultivated areas, and available water capacity is moderate. The surface layer is about 3 percent organic matter. It crusts or puddles after hard rain. The subsoil is slightly acid. The shrink-swell potential is moderate in the subsoil.

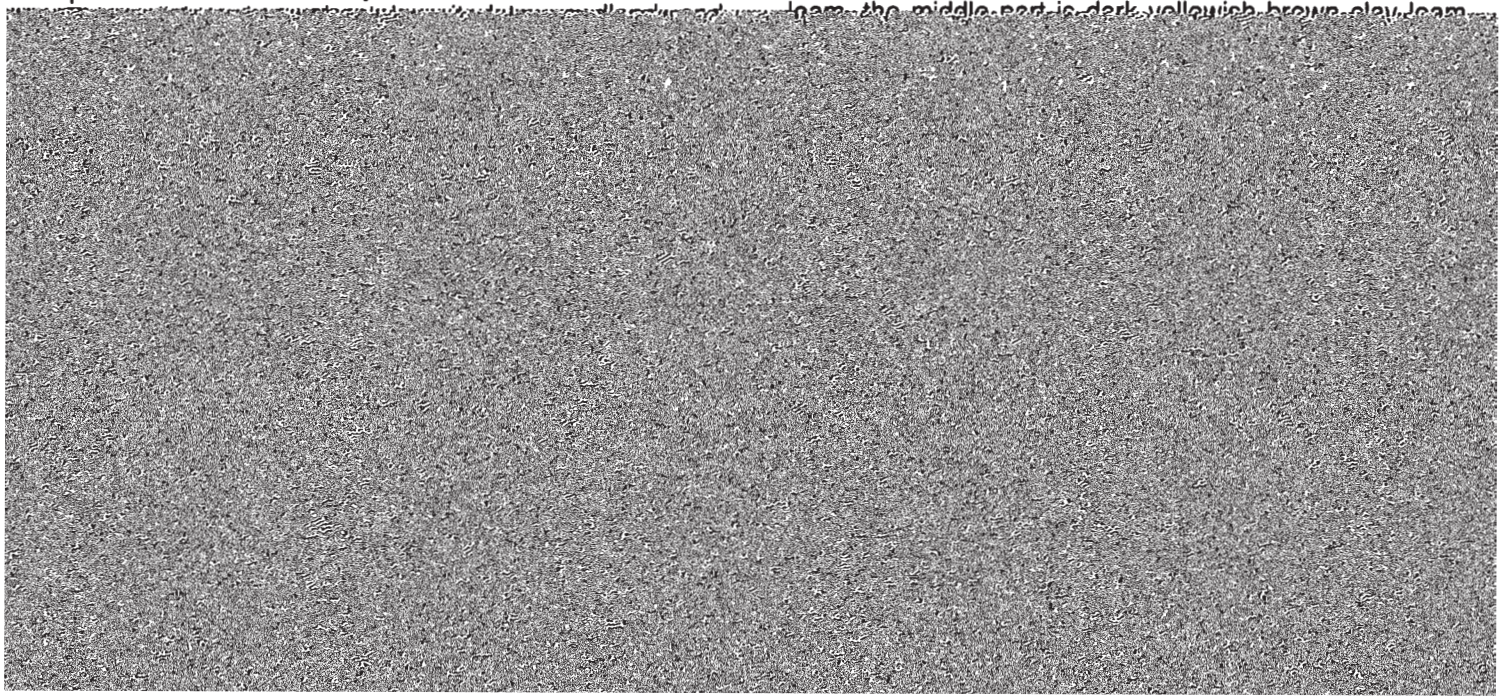
This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. Returning crop residue to the soil or regular additions of other organic material maintains fertility and reduces crusting. Soil blowing can be controlled by using minimum tillage that leaves residue on the surface or that partly incorporates the residue into the soil.

This soil is suited to dwellings. The shrink-swell potential is a limitation, but foundations can be designed to overcome this problem. The soil lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material. Onsite septic tank absorption fields work well, but ground water pollution is a hazard as a result of the rapid permeability of the underlying material. The soil is a good source of sand and gravel.

This soil is in capability class I.

398B—Wea silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on broad, high terraces of major river valleys. Areas are linear in shape and range from 2 to 100 acres in size.

Typically, the surface layer is very dark gray silt loam about 6 inches thick. The subsurface layer is very dark brown silt loam about 5 inches thick. The subsoil is about 46 inches thick. The upper part is dark brown silt loam, the middle part is dark yellowish brown clay loam



material. Onsite septic tank absorption fields work well, but ground water pollution is a hazard as a result of rapidly permeable gravel.

This soil is in capability subclass IIe.

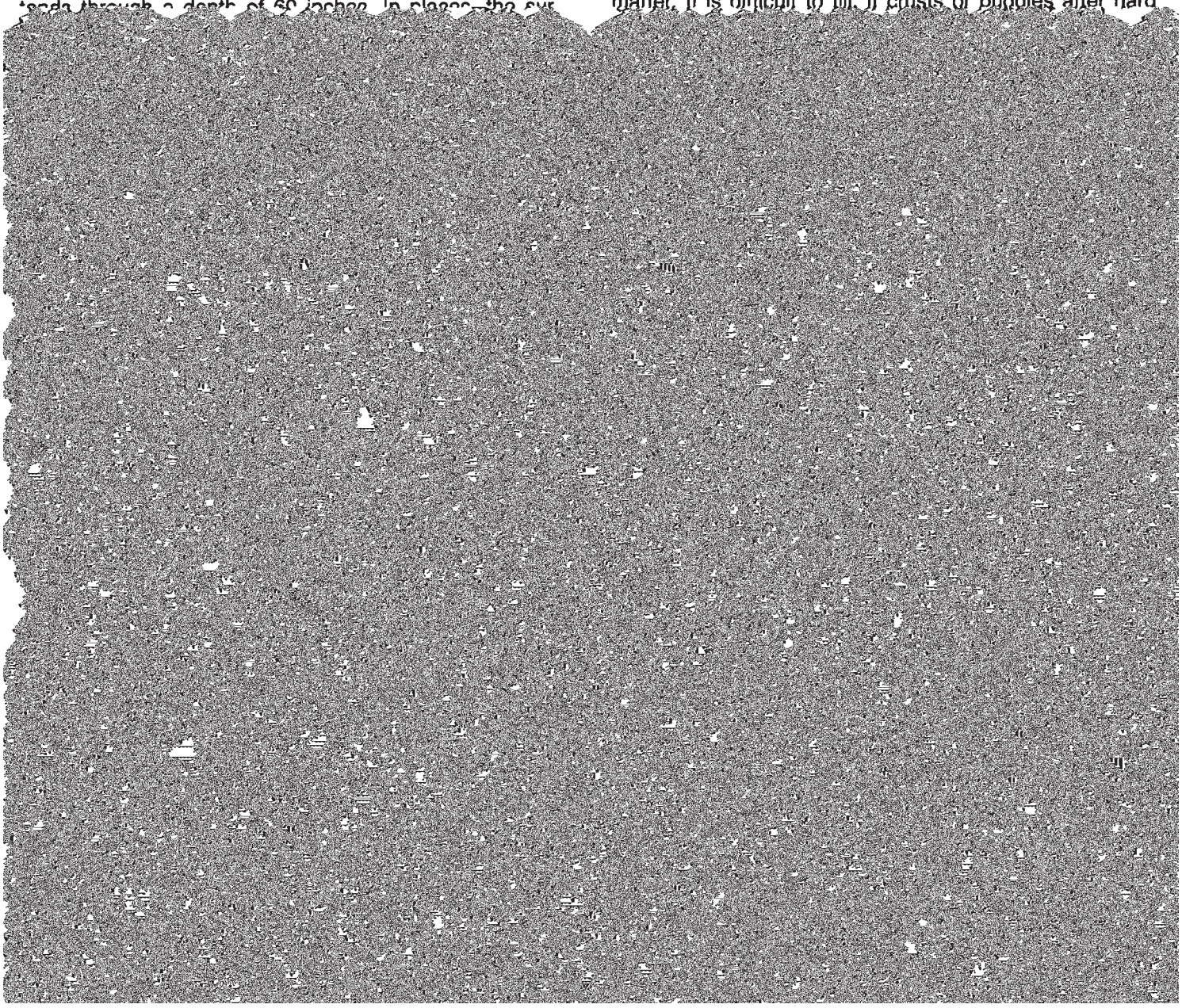
410B—Woodbine silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on convex upper side slopes and ridgetops of uplands. Areas are irregular in shape and range from 2 to 60 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil is about 44 inches thick. The upper part is yellowish brown silty clay loam, the middle part is yellowish brown and dark brown clay loam, and the lower part is yellowish red silty clay and strong brown clay. Fractured, dolomitic limestone bedrock extends through a depth of 60 inches. In places the sur-

and dark brown clay loam, and the lower part is yellowish red silty clay and strong brown clay. Fractured dolomitic limestone bedrock underlies the subsoil to a depth of 60 inches. In places, the surface layer is thinner and is silty clay loam or clay loam.

Included with this soil in mapping are small areas of Flagg soils. These soils are in similar positions as Woodbine soils, but they do not have bedrock within 60 inches of the surface. Flagg soils make up 2 to 5 percent of the unit.

This Woodbine soil has moderate permeability in the upper part of the subsoil and slow permeability in the lower part of the subsoil. Surface runoff from cultivated areas is medium, and available water capacity is moderate. The surface layer is about 1.5 percent organic matter. It is difficult to till. It crusts or puddles after hard

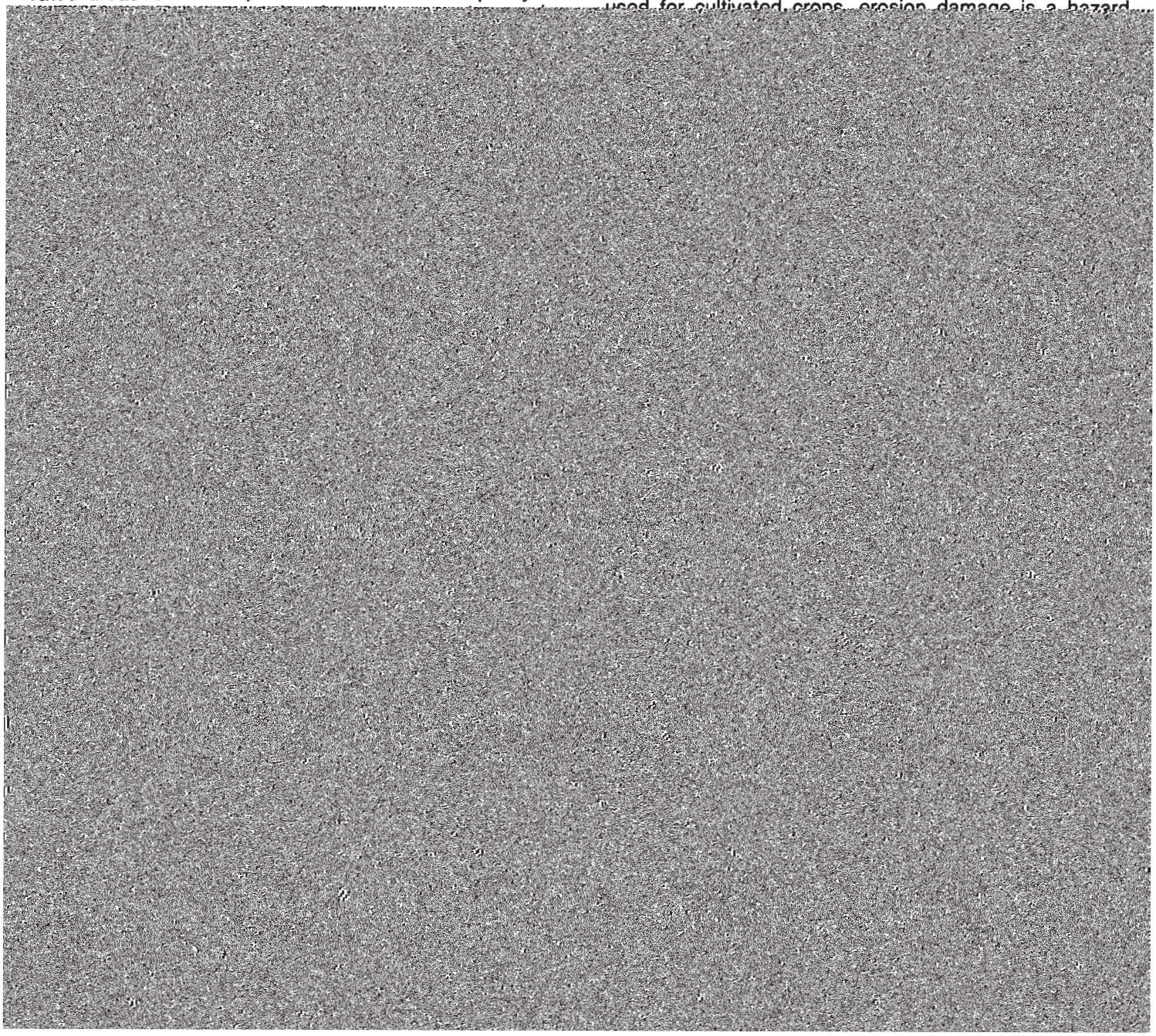


Included with this soil in mapping are small areas of well drained and moderately well drained Catlin, Ogle, Plano, and Tama soils. Tama soils have more than 5 feet of loess. In Ogle soils, a reddish paleosol layer is at a depth of about 3 feet. In Catlin soils, calcareous loam till is at a depth of about 4 feet. Plano soils are underlain by outwash at a depth of about 4 feet. These soils are in similar positions on the landscape as Ashdale soils, and they make up 5 to 12 percent of the unit.

This Ashdale soil has moderate permeability in the upper part of the subsoil and moderately slow or slow permeability in the lower part. Surface runoff from cultivated areas is medium, and available water capacity is

This Ashdale soil has moderate permeability in the upper part of the subsoil and moderately slow permeability or slow permeability in the lower part. The surface runoff from cultivated areas is medium, and available water capacity is high. The surface layer is about 2.5 percent organic matter. It is difficult to till. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is medium acid to strongly acid. The shrink-swell potential is moderate in the upper part of the subsoil and high in the lower part. The frost heave potential is high.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. When the soil is used for cultivated crops, erosion damage is a hazard.



water capacity is high. The surface layer is about 4 percent organic matter. It crusts or puddles after hard rain, especially in the areas where the plow layer contains subsoil material. The subsoil is neutral. Root development is restricted below a depth of about 50 inches by compact, reddish glacial till. The shrink-swell potential is moderate in the subsoil. The frost heave potential is high.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or the regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to dwellings. The shrink-swell potential is a limitation, but foundations can be designed to overcome this problem. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action. These limitations can be corrected by strengthening or replacing the base material. The soil is well suited to septic tank absorption fields.

This soil is in capability subclass IIe.

412C2—Ogle silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on convex ridgetops, knolls, and uneven side slopes. Areas are irregular in shape and range from 2 to 15 acres in size.

Typically, the surface layer is very dark gray silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is dark brown and dark yellowish brown, friable silty clay loam; the middle part is yellowish brown, friable silty clay loam and silt loam; and the lower part is reddish brown and yellowish red, friable and firm clay loam. In places, the subsoil is thinner and shallower to a clay substratum than is typical. In areas where the upper part of the subsoil has tillage, contour farming, cover crops, and terraces help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is suited to dwellings. The shrink-swell potential is a limitation, but foundations can be designed to overcome this problem. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action. These limitations can be corrected by strengthening or replacing the base material. The soil is well suited to septic tank absorption fields.

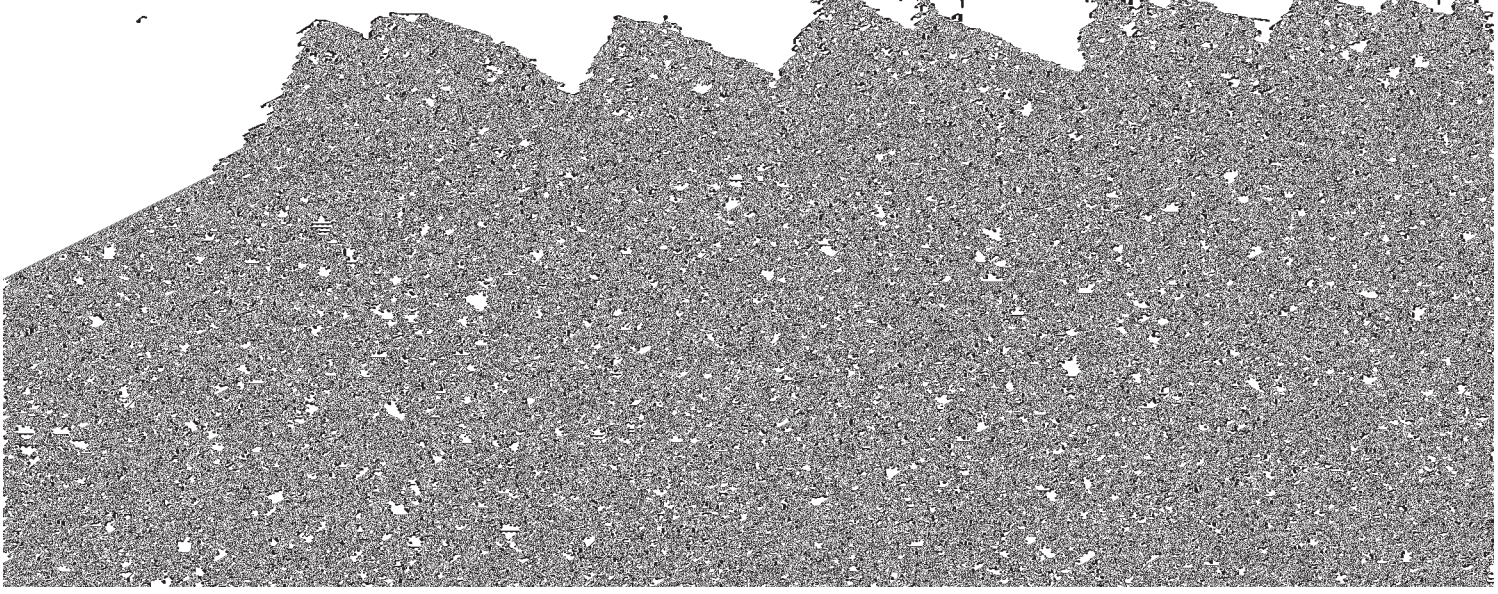
This soil is in capability subclass IIe.

414B—Myrtle silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on convex side slopes. Areas are irregular in shape and range from 2 acres to several hundred acres in size.

Typically, the surface layer is very dark grayish brown and yellowish brown silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown and yellowish brown, friable silty clay loam; the middle part is dark yellowish brown and yellowish brown loam; and the lower part is yellowish red sandy clay loam. In places, the silty part of the subsoil is thicker than is typical. In a few places, the substratum is yellowish brown sandy loam, loamy sand, or sand. Also, in some places, the soil is moderately well drained.

Included with this soil in mapping are small areas of somewhat poorly drained Elburn soils. These soils are in shallow depressions and drainageways, and they make up 2 to 5 percent of the unit.

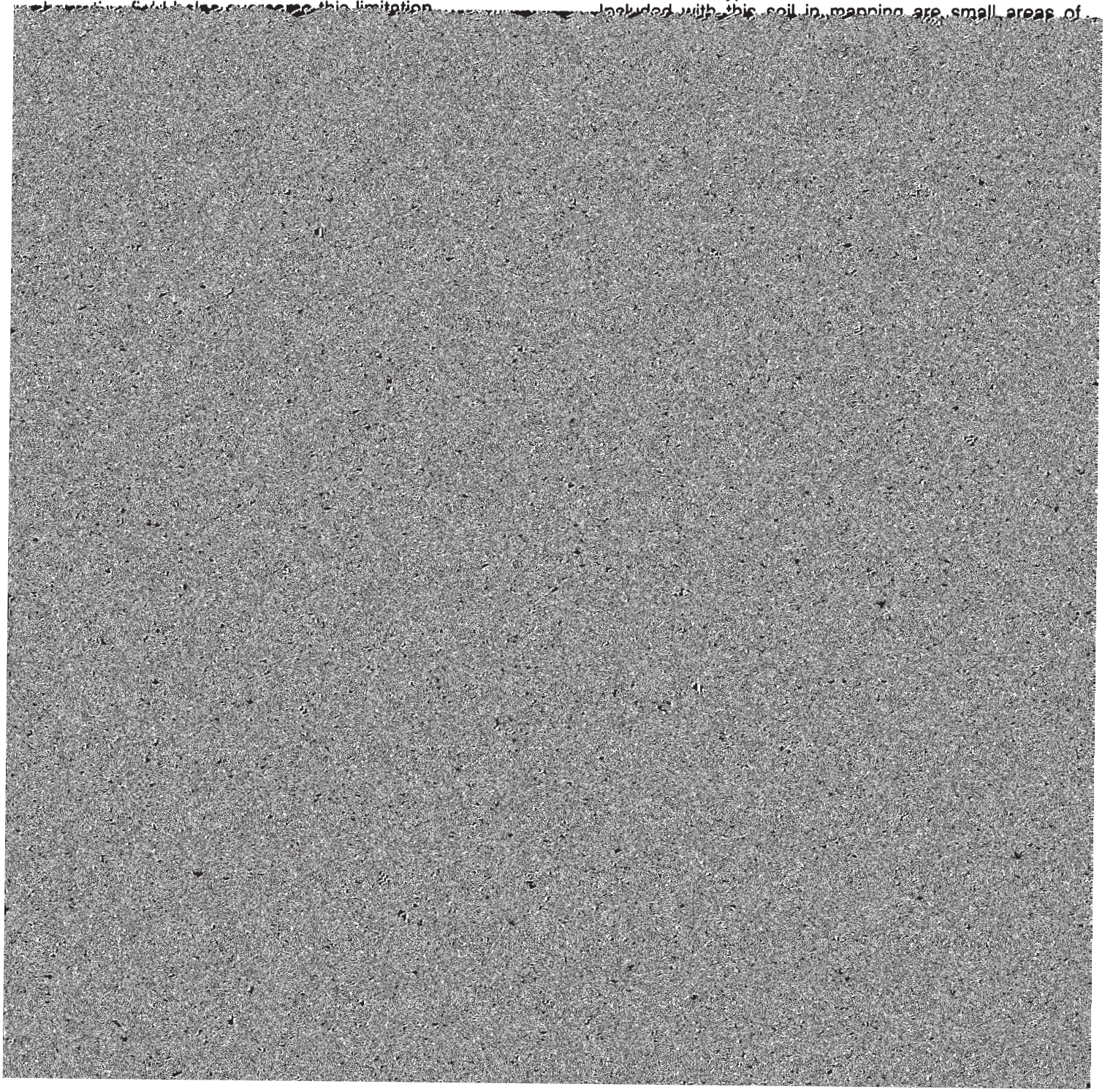
This Myrtle soil has moderate permeability. Surface



This soil is suited to dwellings. The shrink-swell potential is a limitation, but foundations can be designed to overcome this problem. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action. These limitations can be corrected by strengthening or replacing the base material. The soil is only moderately suited to septic tank absorption fields because of the permeability. Increasing the size of the [illegible] this limitation.

Typically, the surface layer is black silt loam about 7 inches thick. The subsurface layer is very dark grayish brown silt loam about 6 inches thick. The subsoil is about 47 inches thick. The upper part is dark brown silty clay loam and clay loam, the middle part is reddish brown loam, and the lower part is yellowish red loam. In places, the subsoil is thinner and shallower to calcareous material than is typical.

Included with this soil in mapping are small areas of

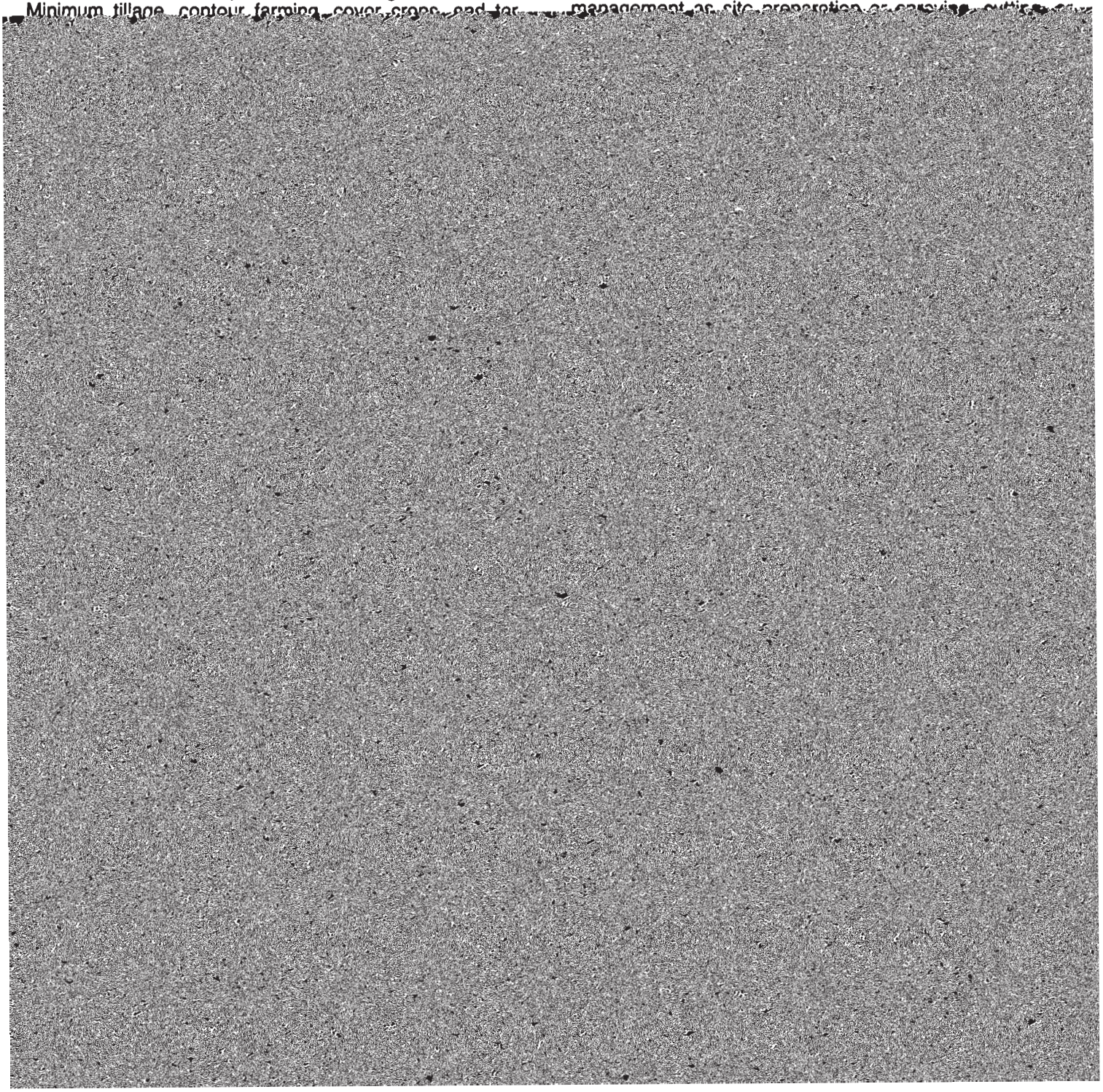


medium acid. The shrink-swell potential is moderate in the subsoil. Root development is restricted below a depth of about 24 inches by compact, reddish, loamy glacial till.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. When the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, sod for

prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or cutting



seedlings survive and grow well with such good timber management as site preparation, or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting or harvesting trees.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is suited to dwellings and septic tank absorption fields. The shrink-swell potential is a limitation for dwellings, but foundations can be designed to overcome this problem. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action. These limitations can be corrected by strengthening or replacing the base material. The moderate permeability is a limitation for septic tank absorption fields; increasing the size of the absorption field can overcome this problem.

This soil is in capability subclass IIe.

429B—Palsgrove silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on convex ridgetops and knolls. Areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is dark grayish brown and dark brown silt loam about 10 inches thick. The subsoil is about 49 inches thick. The upper part is dark yellowish brown, friable silty clay loam; the middle part is dark [illegible] yellowish brown, friable silty clay

material maintains fertility, reduces crusting, and increases water infiltration.

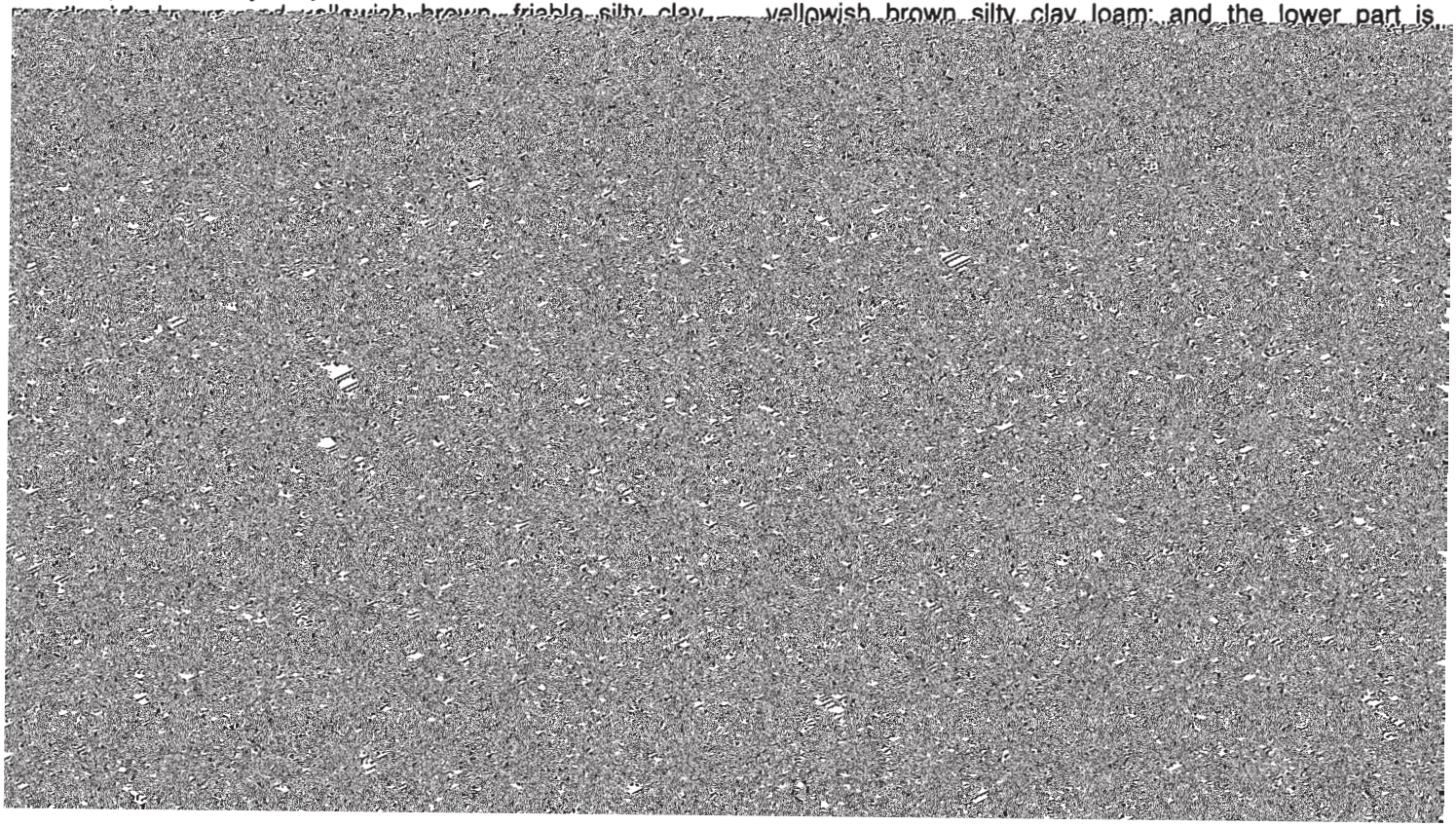
This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation or spraying, cutting, or girdling. There are few hazards or limitations to planting or harvesting trees.

This soil is only moderately suited to poorly suited to dwellings because of the shrink-swell potential, but foundations can be designed to overcome this limitation. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action. These limitations can be corrected by strengthening or replacing the base material. The soil is very poorly suited to septic tank absorption fields because of the very slow permeability in the lower part and depth to bedrock. The underlying bedrock is a source of agricultural lime and crushed rock.

This soil is in capability subclass IIe.

429C2—Palsgrove silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on convex ridgetops and uneven side slopes. Areas are elongated or irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is very dark brown silt loam about 7 inches thick. The subsoil is about 45 inches thick. The upper part is dark yellowish brown, friable silty clay loam; the middle part is yellowish brown and dark yellowish brown silty clay loam; and the lower part is



tillage, contour farming, cover crops, and grassed waterways help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

This soil is suited to woodland. A few small areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation, or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting or harvesting trees.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is only moderately suited to poorly suited to dwellings because of the shrink-swell potential, but foundations can be designed to overcome this limitation. The soil lacks sufficient strength and stability to support vehicular traffic and is limited by frost action. These limitations can be corrected by strengthening or replacing the base material. The soil is very poorly suited to septic tank absorption fields because of the very slow permeability in the lower part and depth to bedrock. The underlying bedrock is a source of agricultural lime and crushed creases water infiltration. Minimum tillage is effective in maintaining favorable soil tilth.

This soil is suited to dwellings. It lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material. It is suited to septic tank absorption fields. Permeability can be a limitation; but it can be overcome by increasing the size of the absorption field.

This soil is in capability class I.

440B—Jasper loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on uplands and slightly elevated areas of terraces along streams. Areas are irregular in shape and range from 2 to 150 acres in size.

Typically, the surface layer is very dark gray loam about 9 inches thick. The subsurface layer is very dark gray loam about 4 inches thick. The subsoil is about 34 inches thick. The upper part is brown, friable silt loam; the middle part is dark yellowish brown, friable clay loam; and the lower part is dark yellowish brown, friable sandy loam and loamy sand. The substratum, to a depth of 60 inches, is yellowish brown and brown silt loam. In places, the surface layer is thinner. In some places, the soil is moderately well drained.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue soil. This soil is at slightly lower positions on the landscape than Jasper

able sandy loam. The substratum, to a depth of 60 inches, is yellowish brown silt loam. In places, the surface layer is thinner than typical. In some places, the soil is moderately well drained.

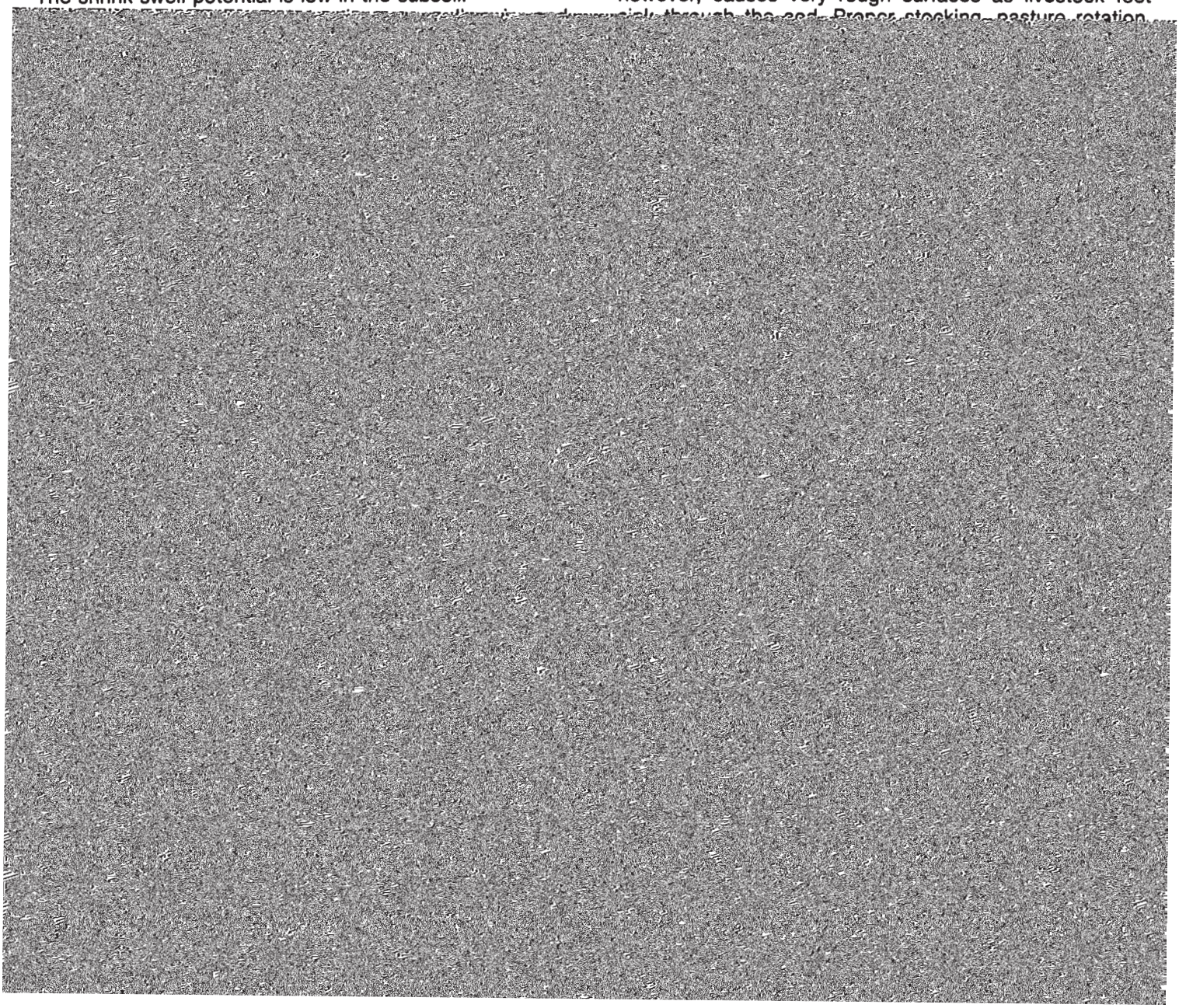
Included with this soil in mapping are small areas of Atkinson and Parr soils. These soils are on slightly steeper parts of side slopes and make up 2 to 5 percent of the unit.

This Jasper soil has moderate permeability. Surface runoff is medium, and available water capacity is high. The surface layer is about 2.5 percent organic matter. It is difficult to till. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is medium acid or strongly acid. The shrink-swell potential is low in the subsoil.

feet. The surface layer is about 4 percent organic matter. The subsoil is mildly alkaline. The shrink-swell potential is moderate in the substratum. The frost heave potential is high.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, the hazard of flooding and deposition of additional soil can cover plants. Protecting the soil from flooding and artificially draining wet areas by subsurface drainage minimize damage to crops. Soil erosion is a limitation if the soil is disturbed and left bare and exposed for a considerable period of time.

Using this soil for pasture and hay effectively controls damage by flooding. Grazing when the soil is too wet, however, causes very rough surfaces as livestock feet [illegible] through the sod. Proper stocking, pasture rotation,



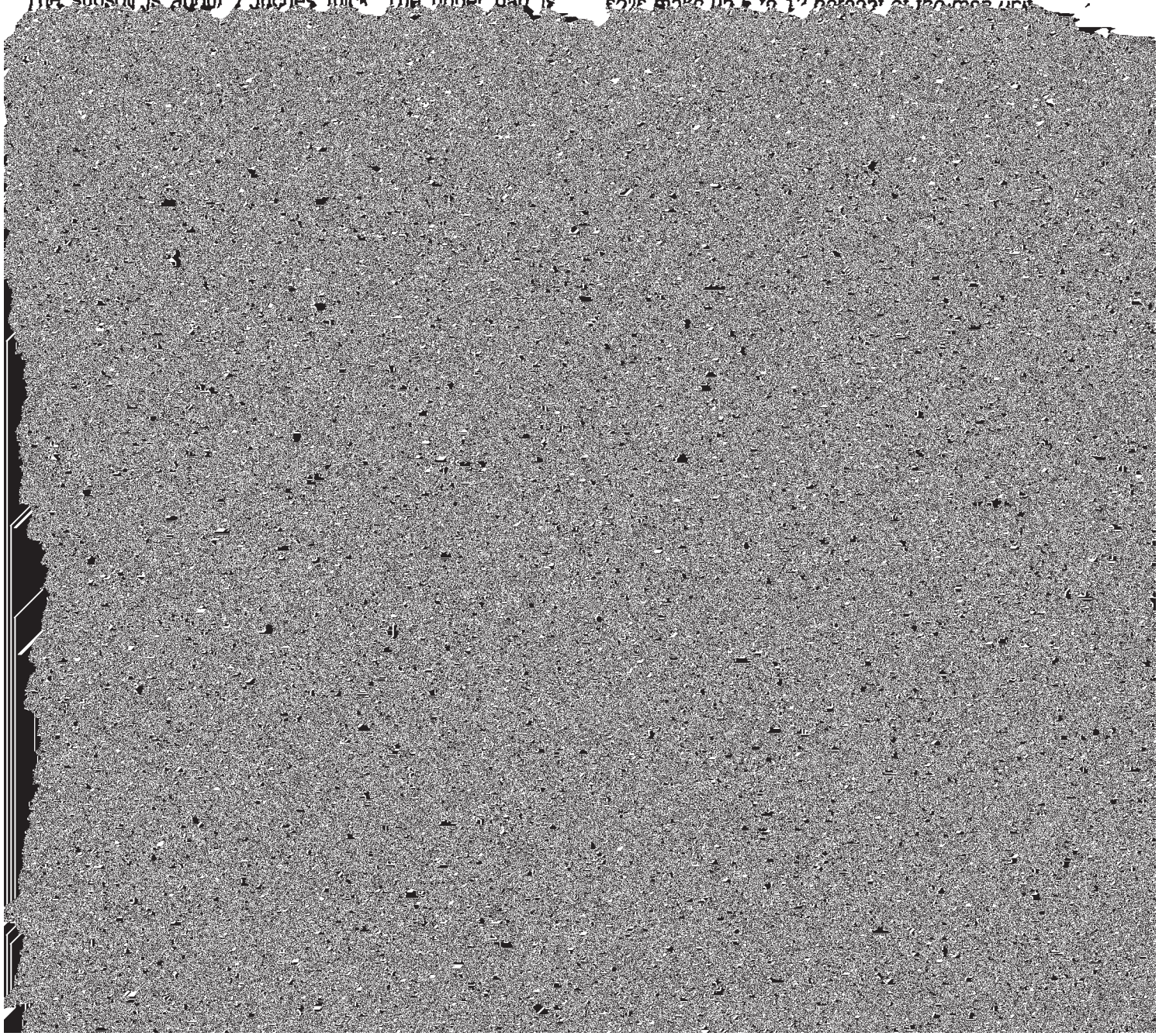
limitation for dwellings. The permeability and the seasonal high water table are limitations for septic tank absorption fields.

This soil is in capability class I.

503B—Rockton silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on convex ridges and broad side slopes. Areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is black silt loam about 7 inches thick. The subsurface layer is black, very dark gray, and dark brown silt loam about 15 inches thick. The subsoil is about 7 inches thick. The upper part is thick. The upper part is brown, friable clay loam; the lower part is dark yellowish brown, firm clay. The subsoil is underlain by limestone bedrock at a depth of about 24 inches. In places, the subsoil is thicker and deeper to bedrock. Where the upper part of the subsoil has been mixed with the former surface soil by plowing, the present surface layer is dark brown silt loam. In places, the bedrock crops out on the surface.

Included with this soil in mapping are small areas of well drained Jasper soils and soils that have till or outwash over the bedrock. In Jasper soils, loamy outwash material extends to a depth of 60 inches. These soils make up 5 to 12 percent of the map unit.

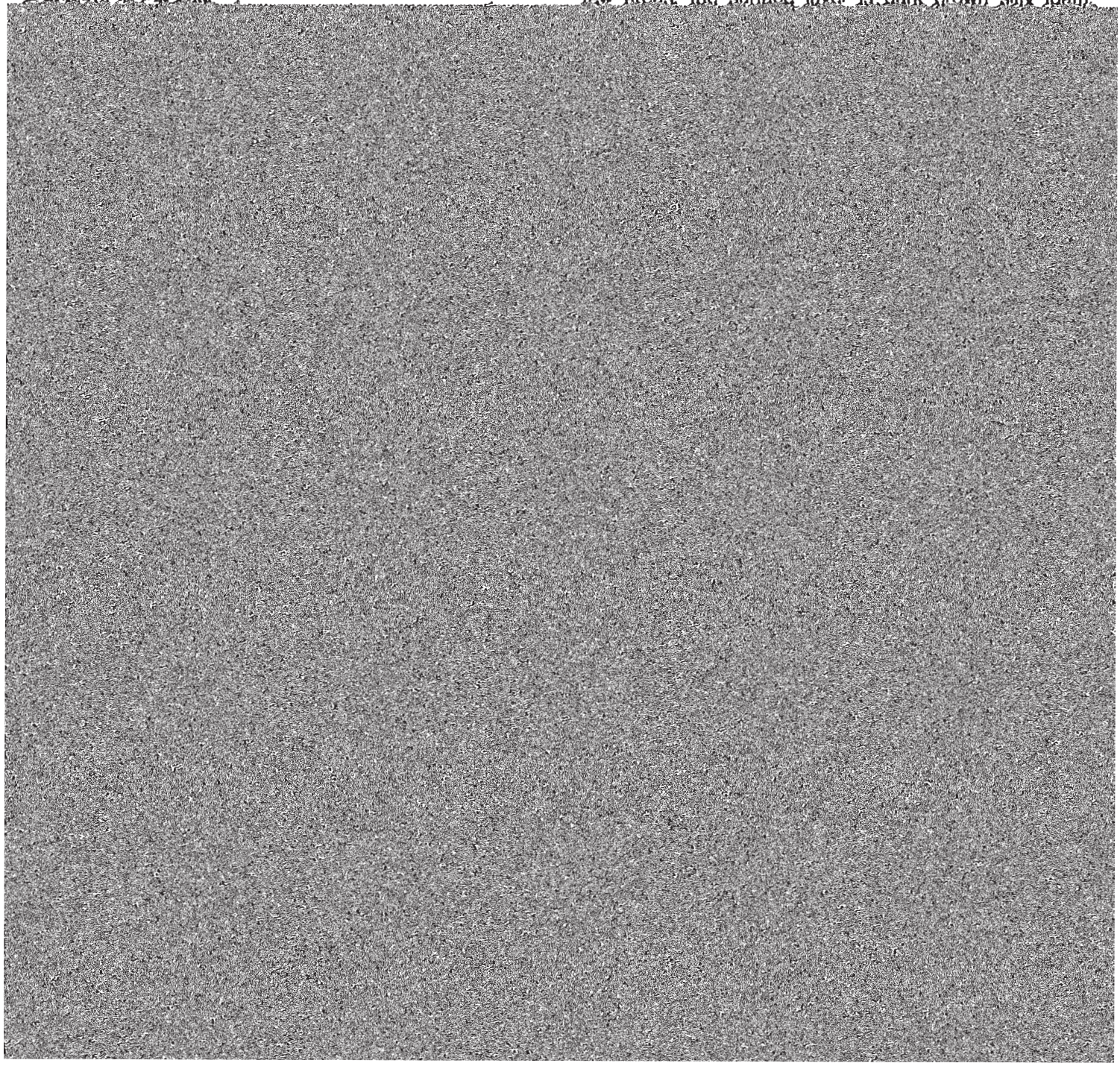


very firm clay in the lower part. In a few places, the surface layer is dark grayish brown silt loam or dark yellowish brown silty clay loam.

Included with this soil in mapping are areas of well drained Griswold and Winnebago soils. These soils are in similar positions on the landscape as Sogn soils, but they are more than 6 feet thick over bedrock and bedrock crops out at the surface. These soils make up 2 to 5 percent of the unit.

convex side slopes on uplands. Areas are irregular in shape and range from 3 to 20 acres in size.

Typically, the surface layer is dark grayish brown silty clay loam about 7 inches thick. The subsoil is about 11 inches thick. The upper part is dark brown and dark grayish brown silt loam, the middle part is dark brown silty clay loam, and the lower part is dark yellowish brown clay. The subsoil is over dolomitic bedrock. In a few areas, the surface layer is dark brown silty loam.



soils are on similar landscapes as Dunbarton soils, and they make up 10 to 15 percent of the unit.

This Dunbarton soil has moderately slow permeability. Surface runoff is medium, and available water capacity is low. The surface layer is about 1.5 percent organic matter. It is difficult to till. It is generally neutral, and the subsoil is slightly acid or neutral. The shrink-swell potential is high in the lower part of the subsoil. Root development is restricted below a depth of about 18 inches by dolomitic bedrock.

This soil is suited to small grain and grass and legume hay and pasture. The erosion hazard and low available water capacity are the major concerns of farming. Minimum tillage, contour farming, crop residue management, and cover crops help reduce soil losses and conserve moisture. Proper stocking, uniform grazing distribution, and a planned grazing system keep the pasture and soil in good condition.

This soil is in capability subclass IVe.

505E2—Dunbarton silty clay loam, 12 to 20 percent slopes, eroded. This strongly sloping and moderately steep, well drained soil is on convex side slopes on uplands. Areas are irregular in shape and range from 3 to 25 acres in size.

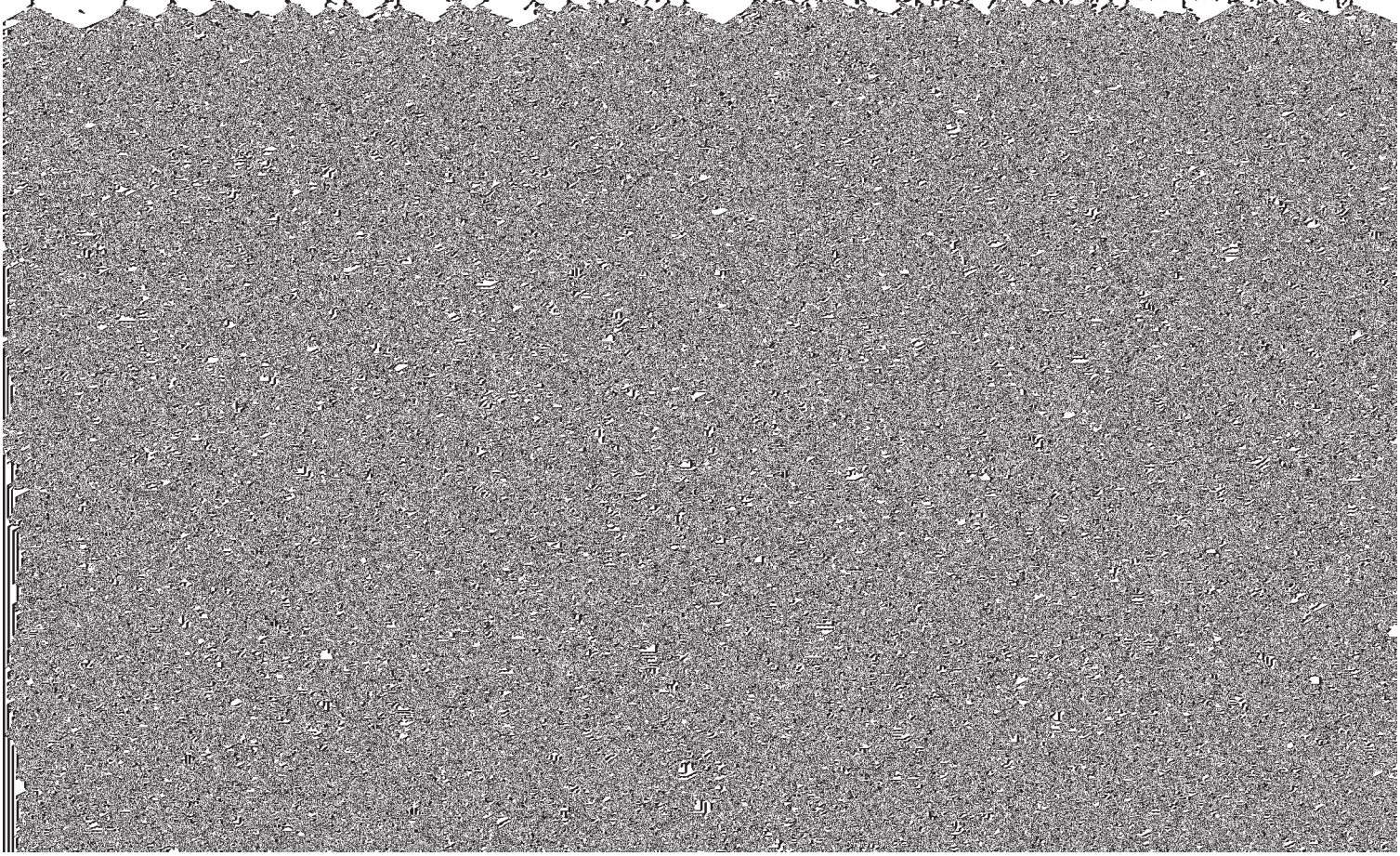
Typically, the surface layer is brown and dark yellowish

509B—Whalan loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on convex, upland ridges. Areas are irregular in shape and range from 2 to 100 acres in size.

Typically, the surface layer is dark grayish brown loam about 7 inches thick. The subsurface layer is dark grayish brown loam about 3 inches thick. The subsoil is about 28 inches thick. The upper part is dark brown, friable clay loam; the middle part is dark yellowish brown, friable clay loam; and the lower part is reddish brown, firm clay. The subsoil is over brownish yellow fractured dolomitic bedrock. In places, the subsoil is thicker and bedrock is at a depth of more than 40 inches. In places, the reddish brown clay layer is more than 6 inches thick.

Included with this soil in mapping are well drained Pecatonica and Westville soils. These soils formed in loamy glacial drift, are void of bedrock, and are in similar positions on the landscape as Whalan soils.

This Whalan soil has moderate permeability in the upper part of the subsoil and slow permeability in the lower part. Surface runoff from cultivated areas is medium and available water capacity is low. The surface layer is about 2 percent organic matter. The soil is neutral to strongly acid. Root development is restricted below a depth of about 36 inches by fractured, dolomitic bedrock. The shrink-swell potential is high. The frost action potential is moderate.



slopes. Areas are irregular in shape and range from 2 acres to more than 100 acres in size.

Typically, the surface layer is dark grayish brown loam about 7 inches thick. The subsoil is about 22 inches thick. The upper part is dark brown, friable clay loam; the middle part is dark yellowish brown, friable clay loam; and the lower part is reddish brown, firm clay. The subsoil is over brownish yellow, dolomitic sand and fractured bedrock. In places, the subsoil is thicker than is typical and bedrock is at a depth of more than 40 inches. In places, the subsoil is thinner and shallower to bedrock than is typical. In some places, the reddish brown clay layer is more than 6 inches thick.

Included with this soil in mapping are Westville and Pecatonica soils. These well drained soils formed in loamy glacial drift, are devoid of bedrock, and are in similar positions on the landscape as Whalan soils. These soils make up 2 to 10 percent of the unit.

This Whalan soil has moderate permeability in the upper part of the subsoil and slow permeability in the lower part. Surface runoff from cultivated areas is medium, and available water capacity is low. The surface layer is about 1.5 percent organic matter. It is difficult to till. The subsoil is neutral to strongly acid. The shrink-swell potential is high in the subsoil. Root development is restricted below a depth of about 36 inches by bedrock. The frost action potential is moderate.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. The hazard of erosion and low available water capacity are the major concerns for farming. Minimum tillage, contour farming, and cover crops help reduce soil losses and conserve moisture. If used for pasture, proper stocking, uniform grazing distribution, and a planned grazing system keep the pasture and soil in good condition.

This soil is suited to woodland. A few areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation, or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting or harvesting trees.

This soil is well suited to dwellings without basements but is only moderately suited to dwellings with base-

ridges and convex side slopes. Areas are irregular in shape and range from 3 to 55 acres in size.

Typically, the surface layer is dark grayish brown loam about 4 inches thick. The subsoil is about 20 inches thick. The upper part is dark brown, friable clay loam; the middle part is dark yellowish brown clay loam; and the lower part is reddish brown, firm clay. The subsoil is over brownish yellow, dolomitic sand and fractured bedrock. In places, the subsoil is thicker than is typical and bedrock is at a depth of more than 40 inches. In other places, the subsoil is thinner and shallower to bedrock than is typical.

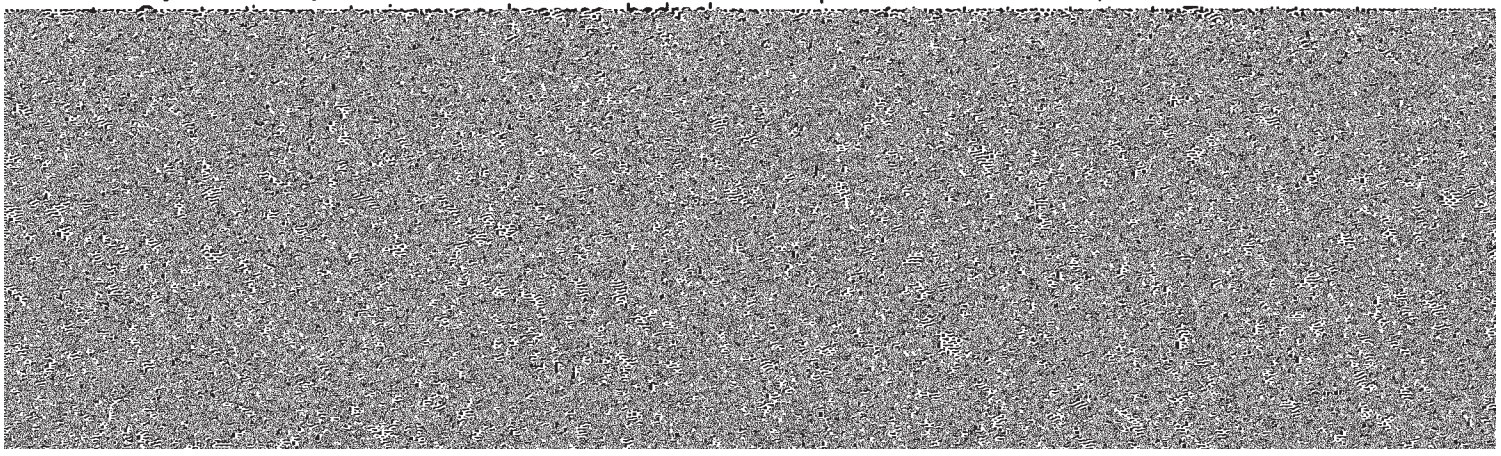
Included with this soil in mapping are Martinsville and Pecatonica soils. Martinsville soils formed in loamy material. Pecatonica soils formed in reddish clay loam or sandy loam buried soils. The Martinsville and Pecatonica soils are well drained and are on similar positions on the landscape as this Whalan soil. They make up 2 to 5 percent of the unit.

This Whalan soil has moderate permeability in the upper part of the subsoil and slow permeability in the lower part. Surface runoff from cultivated areas is rapid and available water capacity is low. The surface layer is about 1.5 percent organic matter. It is difficult to till. The subsoil is neutral to strongly acid. The shrink-swell potential is high in the subsoil. Root development is restricted below a depth of about 36 inches by limestone bedrock. The frost action potential is moderate.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. The erosion hazard and low available water capacity are the major concerns of farming. Minimum tillage, contour farming, and cover crops help reduce soil losses and conserve moisture. Proper stocking, uniform grazing distribution, and a planned grazing system keep pasture and soil in good condition.

This soil is suited to woodland. A few areas remain in native hardwoods. Tree seeds, cuttings, and seedlings survive and grow well with such good timber management as site preparation, or spraying, cutting, or girdling. Slope is the main hazard or limitation to planting or harvesting trees.

This soil is suited to dwellings without basements. The slope can be a limitation, and alteration is difficult be-



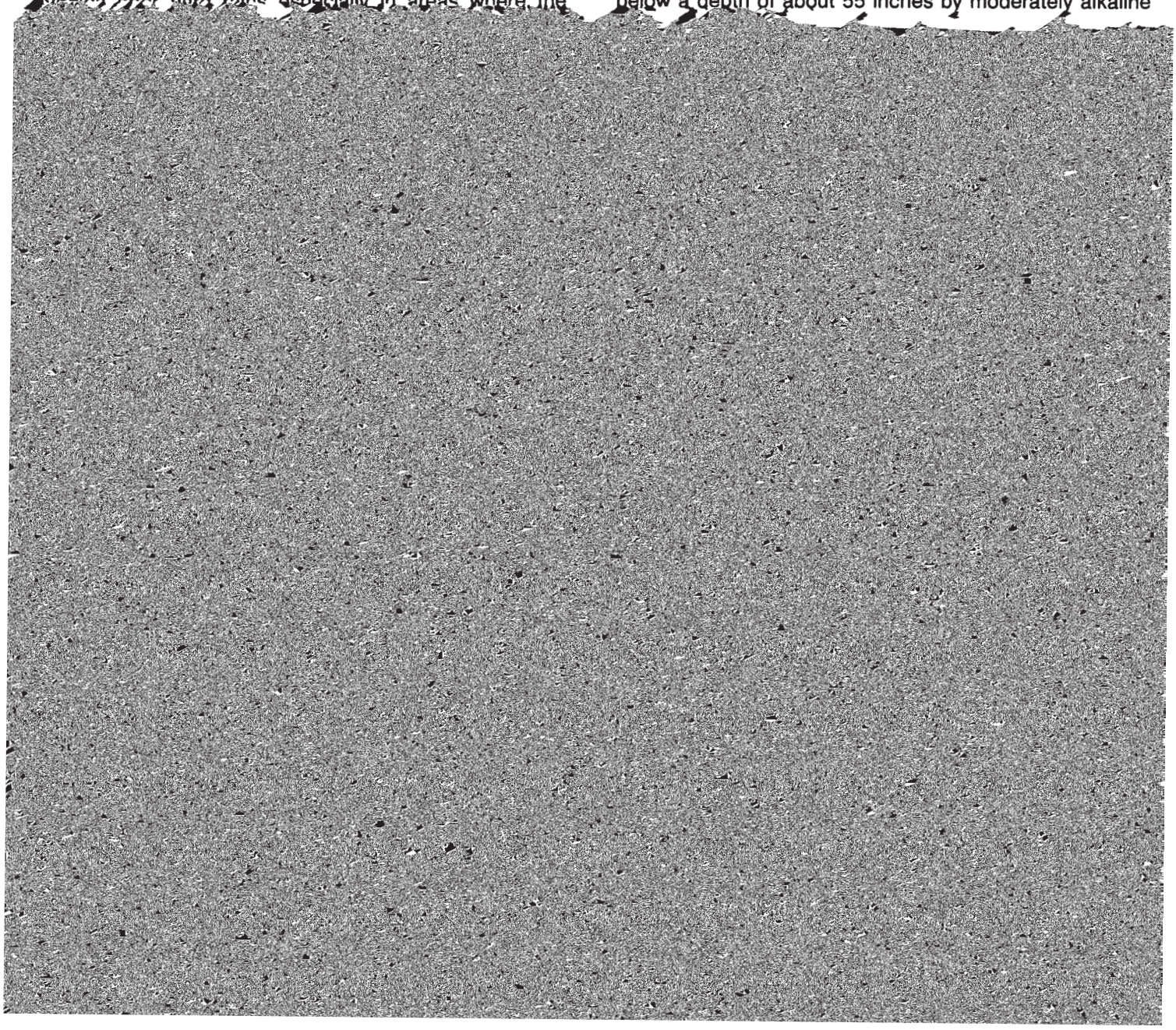
This soil is in capability subclass IVe.

and brown silt loam about 7 inches thick. The subsoil is about 36 inches thick. The upper part is dark yellowish

loam. In places, the substratum is sand and gravel. Also, in some places, the soil is moderately well drained.

Included with this soil in mapping are small areas of well drained Lamont and Whalan soils. Lamont soils have about 2 or 3 feet of sandy loam material over loamy sand or sand. Whalan soils have about 2 or 3 feet of loamy material over limestone bedrock. These soils make up 10 to 15 percent of the unit and are adjacent to Martinsville soils.

This Martinsville soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. The surface layer is about 2 percent organic matter. The surface layer crusts and puddles after hard rains, especially in areas where the



loamy sand or sand. Miami soils have loamy material over calcareous loam till. Whalan soils have about 2 to 3 feet of loamy material over limestone bedrock. These soils make up 10 to 15 percent of the unit and are adjacent to Martinsville soils.

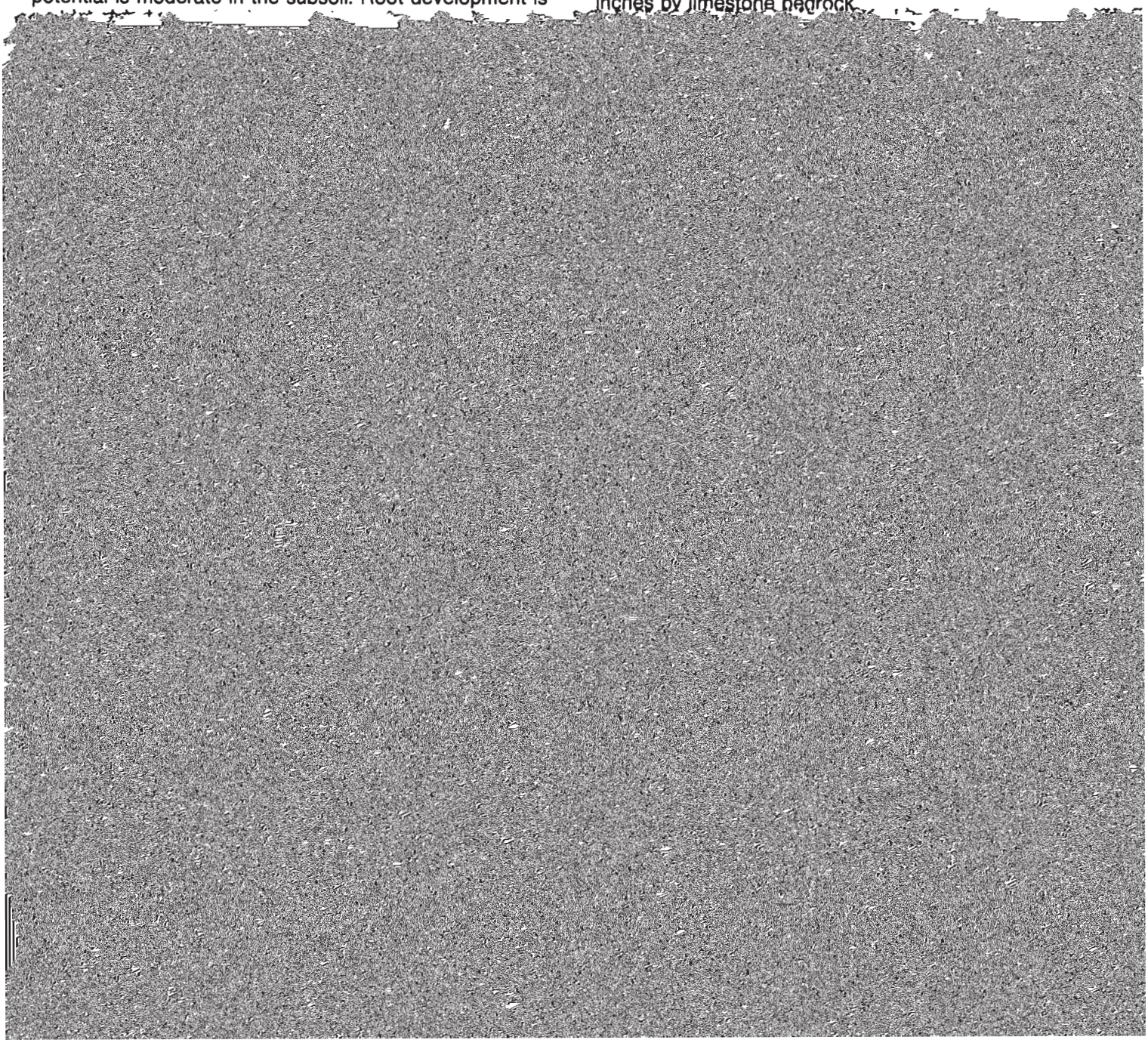
This Martinsville soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. The surface layer is about 1.5 percent organic matter. It is difficult to till. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is slightly acid to strongly acid. The shrink-swell potential is moderate in the subsoil. Root development is restricted below a depth of about 55 inches by moderately alkaline

of loamy material over calcareous loam till. Whalan soils have about 2 or 3 feet of loamy material over limestone bedrock. These soils make up 10 to 15 percent of the unit and are adjacent to Martinsville soils.

This Martinsville soil has moderate permeability. Surface runoff from cultivated areas is rapid, and available water capacity is moderate. The surface layer is about 1.5 percent organic matter. It is difficult to till when eroded. It crusts after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is slightly acid to strongly acid. The shrink-swell potential is moderate in the subsoil. Root development is

outwash. These soils make up 10 to 15 percent of the unit.

This Atkinson soil has moderate permeability in the upper part of the subsoil and slow permeability in the lower part. Surface runoff from cultivated areas is medium, and available water capacity is moderate. The surface layer is about 4 percent organic matter. It crusts or puddles after hard rain, especially in areas where the plow layer contains subsoil material. The subsoil is neutral. The shrink-swell potential is high in the subsoil. Root development is restricted below a depth of about 43 inches by limestone bedrock.



material. The subsoil is neutral. The shrink-swell potential is high in the subsoil. Root development is restricted below a depth of about 50 inches by limestone bedrock.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. If the soil is used for cultivated crops, erosion damage is a hazard. Minimum tillage, contour farming, cover crops, and grassed waterways help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material maintains fertility, reduces crusting, and increases water infiltration.

Using this soil for pasture or hay effectively controls erosion. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor tilth. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep the pasture and soil in good condition.

This soil is suited to dwellings without basements. It is only moderately suited to dwellings with basements because of the bedrock. The soil lacks sufficient strength and stability to support vehicular traffic, but this limitation can be corrected by strengthening or replacing the base material. It is generally not suited to septic tank absorption fields. Effluent from the fields, however, can contaminate ground water supplies because of the rapid infiltration of limestone bedrock. The soil is a suitable source of agricultural lime and crushed rock.

This soil is in capability subclass IIe.

727B—Waukee loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on uplands and slightly

This soil is well suited to dwellings and septic tank absorption fields. There is a hazard of contaminating ground water supplies.

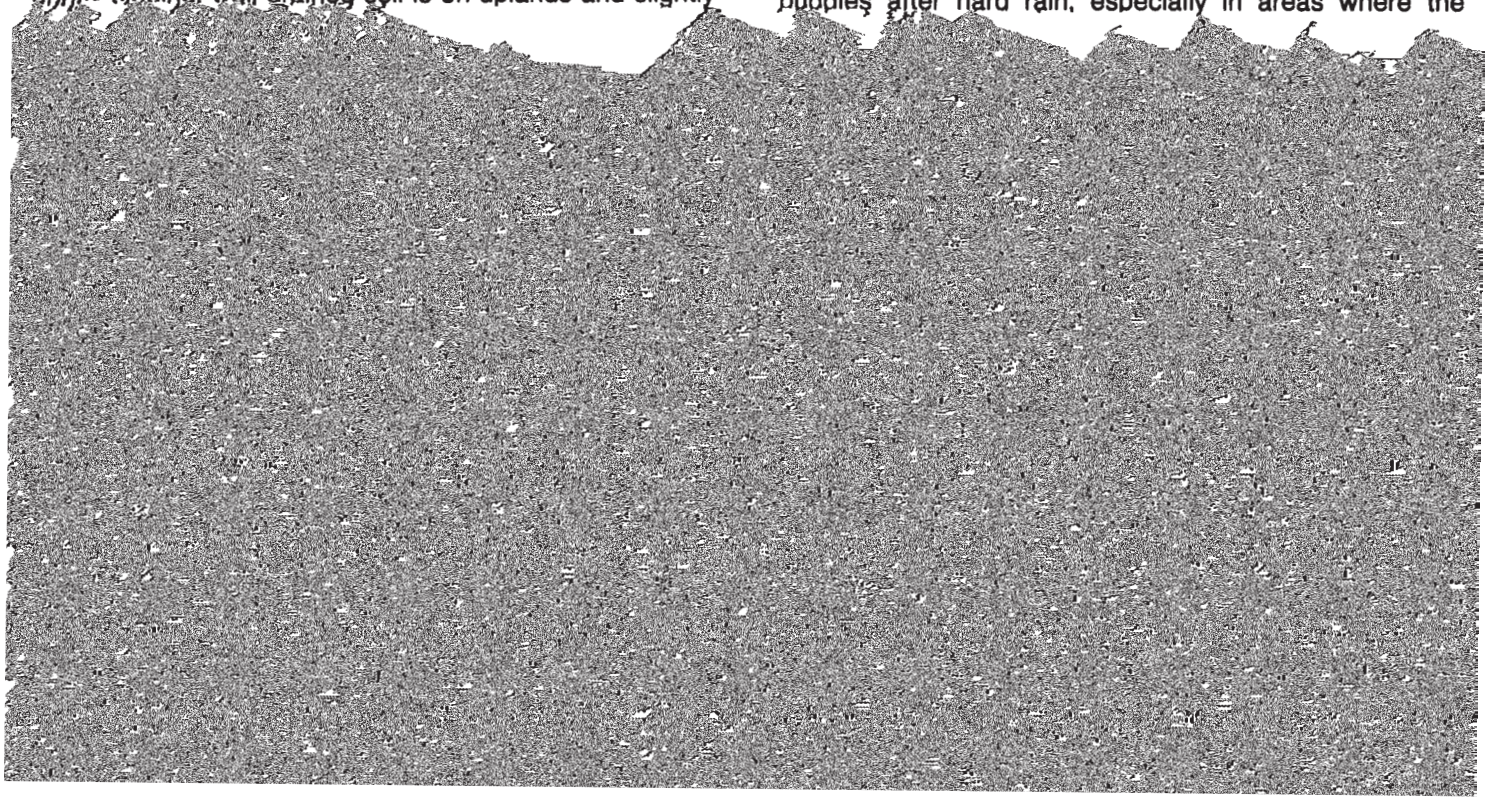
This soil is in capability subclass IIe.

728C2—Winnebago silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on broad, convex ridgetops and upper slopes of uplands. Areas are irregular in shape and range from 2 to 40 acres in size.

Typically, the surface layer is dark brown silt loam about 9 inches thick. The subsoil extends to a depth of more than 68 inches. The upper part is dark yellowish brown, friable clay loam; the middle part is yellowish red and red gravelly clay loam and clay loam; and the lower part is red, friable sandy clay loam. In a few places, the upper part of the subsoil is silty clay loam. In places, the subsoil is thinner than is typical and shallower to sandy loam glacial till that is high in content of lime. In some areas, slope is less than 5 percent. In a few places, sand is within a depth of 60 inches.

Included with this soil in mapping are small areas of Hitt and Rockton soils. These soils are in similar positions on the landscape as Winnebago soils, but they have fractured dolomitic bedrock at a depth ranging from 20 to 60 inches. They make up 2 to 5 percent of the unit.

This Winnebago soil has moderate permeability. Surface runoff from cultivated areas is medium, and available water capacity is high. The surface layer is about 3.5 percent organic matter. It is difficult to till. It crusts or puddles after hard rain, especially in areas where the



tank absoprtion fields, but this problem can be overcome by increasing the size of the absorption field.

This soil is in capability subclass IIe.

742B—Dickinson sandy loam, loamy substratum, 1 to 5 percent slopes. This gently sloping, well drained soil is on low ridges shaped like dunes on upland drainage divides and stream terraces. Areas are irregular in shape and range from 2 to about 40 acres in size.

Typically, the surface layer is very dark gray, very friable sandy loam about 7 inches thick. The subsurface layer is very dark grayish brown and dark brown sandy loam about 13 inches thick. The subsoil is about 40 inches thick. The upper part is dark brown sandy loam, the middle part is dark yellowish brown loamy sand, and the lower part is yellowish brown sand. The substratum, to a depth of 60 inches, is dark yellowish brown and dark brown layers of loam, sandy loam, loamy sand, and sandy clay loam. In places, the subsoil and substratum contain silty material. Also, in some areas, the surface layer is thin and dark, or it is loamy sand.

Included with this soil in mapping are small areas of somewhat poorly drained La Hogue and Millbrook soils. These soils are in shallow depressions and drainageways. They make up 2 to 10 percent of the unit.

This Dickinson soil has rapid permeability in the subsoil and moderate permeability in the substratum. Surface runoff from cultivated areas is slow to medium, and available water capacity is moderate. The surface layer is about 2 percent organic matter. It is subject to soil blowing when dry. The subsoil is medium acid. The shrink-swell potential is low in the subsoil. The frost action potential is moderate.

This soil is suited to corn, soybeans, small grain, and grass and legume hay and pasture. Erosion from both wind and water are hazards. Minimum tillage, cover crops, returning crop residue, and regular additions of other organic material to the soil reduce soil erosion and increase water intake. Contour farming and stripcropping also help control soil blowing and water erosion and conserve moisture. Heavy fertilizer applications generally are not economical because crop growth is limited by moderate available water capacity. Early planting in

on side slopes of ridges shaped like dunes on uplands and on stream terrace breaks. Areas are irregular in shape and range from about 2 to 40 acres in size.

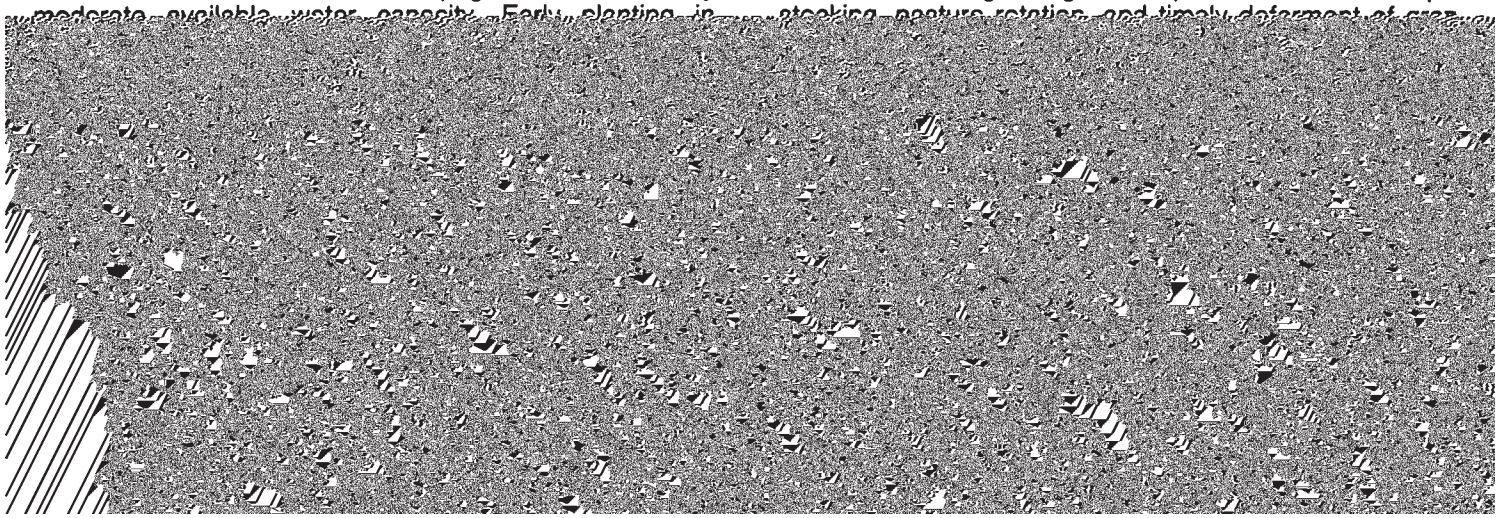
Typically, the surface layer is very dark gray, friable sandy loam about 5 inches thick. The subsurface layer is very dark grayish brown and dark brown sandy loam about 12 inches thick. The subsoil is about 35 inches thick. The upper part is dark brown sandy loam, the middle part is dark yellowish brown loamy sand, and the lower part is yellowish brown sand. The substratum, to a depth of 60 inches, is dark yellowish brown and dark brown layers of loam, sandy clay loam, loamy sand, and sandy loam. In places, the subsoil and substratum contain silty material. In some areas, the surface layer is thin and dark, or it is loamy sand.

Included with this soil in mapping are small areas of somewhat poorly drained La Hogue and Millbrook soils. These soils are in drainageways. They make up 2 to 10 percent of the unit.

This Dickinson soil has rapid permeability in the subsoil and moderate permeability in the substratum. Surface runoff from cultivated areas is medium, and available water capacity is moderate. The surface layer is about 2 percent organic matter. It is subject to soil blowing when dry. The subsoil is medium acid. The frost action potential is moderate.

This soil is suited to small grain, grass and legume hay and pasture, and trees. It is not suited to corn and soybeans because of droughtiness, low fertility, and the erosion hazard. Minimum tillage, cover crops, returning crop residue and regular additions of organic matter maintain fertility, reduce water erosion and soil blowing, and increase water intake. Contour farming, terracing, and stripcropping also help to control erosion and conserve moisture. Heavy applications of fertilizer generally are not economical because crop growth is limited by moderate available water capacity. Early planting of annual crops in spring matures the crop before summer drought becomes severe.

This soil is suited to pasture and hay. Overgrazing increases drought stress and results in lower quality or death of existing forage and pasture stands. Proper

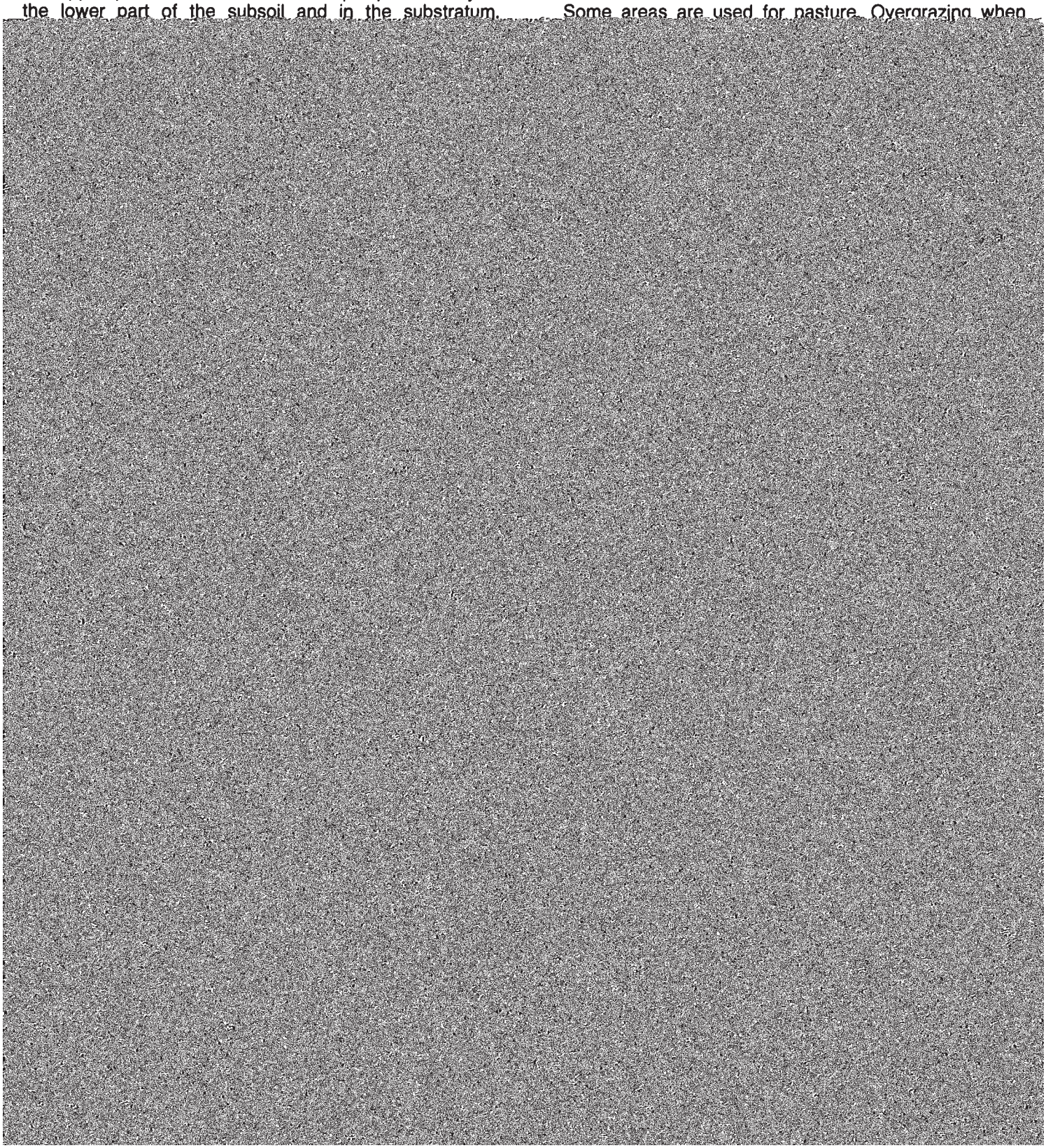


lowish brown sandy loam about 5 inches thick. The sub- tinsville soils have loamy outwash material to a depth of

This Eleva soil has moderately rapid permeability in the upper part of the subsoil and rapid permeability in the lower part of the subsoil and in the substratum.

drainage promotes better conditions for wetland wildlife habitat.

Some areas are used for pasture. Overgrazing when



This soil is in capability subclass IVs.

779D—Chelsea loamy sand, 7 to 15 percent slopes. This sloping to strongly sloping, excessively drained soil is on low, hummocky dunes on broad high terraces and rolling uplands. Areas are crescent or irregular in shape and range from 2 to 40 acres in size.

Typically, the surface layer is very dark brown loamy sand about 3 inches thick. The subsurface layer is yellowish brown sand 35 inches thick. It has thin bands of brown loamy sand in the lower part. The subsoil, to a depth of 60 inches, is brownish yellow sand with thin layers of brown and strong brown loamy sand. In some places, gravel is at a depth of less than 60 inches. A few places have a darker colored surface layer.

Included with this soil in mapping are small areas of excessively drained Eleva soil. This soil has sandstone bedrock at a depth of 20 to 40 inches.

This Chelsea soil has rapid permeability. Surface runoff is medium to rapid, and available moisture capacity is low. The surface layer is about 1 percent organic matter. The subsurface layer is medium acid or slightly acid.

This soil is not suited to cultivated crops. Droughtiness, low fertility, and excessive slope limit crop growth. When cultivated, the soil is subject to damage by soil blowing and water erosion.

Using this soil for Christmas tree production effectively controls soil blowing and conserves soil moisture. A few small areas remain in hardwoods. Seedling mortality is high as a result of droughtiness, but this can be partly overcome by good timber management. The soil needs protection from livestock and fire. Some suitable trees are red pine, eastern white pine, and jack pine.

This soil is moderately suited to openland wildlife habitat. Food and cover should be established as required. Grass and legume mixtures and wild herbaceous plants furnish cover and food for openland wildlife. Special site preparation is necessary to establish vegetation in some eroded or "blowout" areas.

This soil is only moderately suited to dwellings and septic tank absorption fields. Slope is a limitation. This problem can be overcome for dwellings by land shaping and minimized for septic tank absorption fields by placing them on the contour.

This soil is in capability subclass VIs.

802—Orthents, loamy. This map unit consists of moderately fine textured to moderately coarse textured soils that have been mixed by filling and leveling. There is a wide range of soil material. Slope is mainly 0 to 3 percent but ranges to about 15 percent.

The mixed soil material in this unit is mostly silty and loamy in the surface layer and is clay loam, loam, or silty clay loam in the subsoil. The underlying loamy glacial deposits are also mixed. The soil material is commonly 2 rest areas, and large right-of-ways are included. Some pits, where sand and gravel is extracted for construction, are also included. Some places, mainly within urban areas, are as much as 65 percent concrete, asphalt, buildings, steets, and parking lots. Also included are areas that have been or are being used for sanitary landfills.

In Orthents, loamy, permeability is too variable to rate because the soil has been compacted by construction equipment and is variable. Surface runoff is medium to rapid. The available water capacity varies but generally is moderate. This map unit is generally low in organic matter and plant nutrients. Erosion is severe in areas not protected by vegetation.

The vegetation ranges from none in new exposures to good grass sod in some developed areas. Sparse to dense stands of weeds cover older exposures of this map unit. Most areas are idle or are in residential and other nonfarm uses.

Orthents, loamy, is not assigned to a capability subclass.

864—Pits, quarries. This map unit consists mainly of quarries where limestone bedrock has been removed or broken and stockpiled. Also in this unit is one sandstone quarry southwest of Oregon. Soil material generally is dolomitic limestone that ranges from sand to boulder in size. Slope ranges from nearly level on the quarry floor to nearly vertical on the quarry face. Areas range from about 2 acres to more than 100 acres in size.

Most areas of this unit are idle unless currently being excavated. The map unit has poor potential for sanitary facilities. It has fair potential for recreation, especially after excavating has stopped.

Some areas of this unit that have water in the excavation provide a potential habitat for fish and waterfowl. Recreational fishing and swimming are possible in these areas.

Some smaller, abandoned quarries are used for local solid waste disposal. Some larger quarries are being used for sanitary landfill sites for large municipalities. Special precautions are needed to guard against underground water pollution if this map unit is used for solid waste disposal.

Pits, quarries, is not assigned to a capability subclass.

865—Pits, gravel. This map unit consists of material that has been mixed by excavating or stockpiling. Soil material is mainly sandy or gravelly. Slope ranges from 0 to more than 30 percent. Areas range from about 2 acres to more than 100 acres in size.

The soil material in this unit consists mostly of sandy or gravelly substratum material, but some areas are in loam or sandy loam glacial till. The surface and subsoil materials have been removed or mixed during excavation.

Most areas of this unit are idle unless currently being excavated. The map unit has poor potential for cultivated crops, hay and pasture. It has poor potential for building site development and sanitary facilities. It has fair potential for recreation, especially after excavating has stopped.

Some areas of this unit that have water in the excavation provide a potential habitat for fish and waterfowl. Recreational fishing and swimming are also possible in these areas.

The nearly level floor of a large pit is a potential site for park or playground facilities or in some cases for landfill. If the unit is used for solid waste disposal, special precautions to guard against groundwater pollution are necessary.

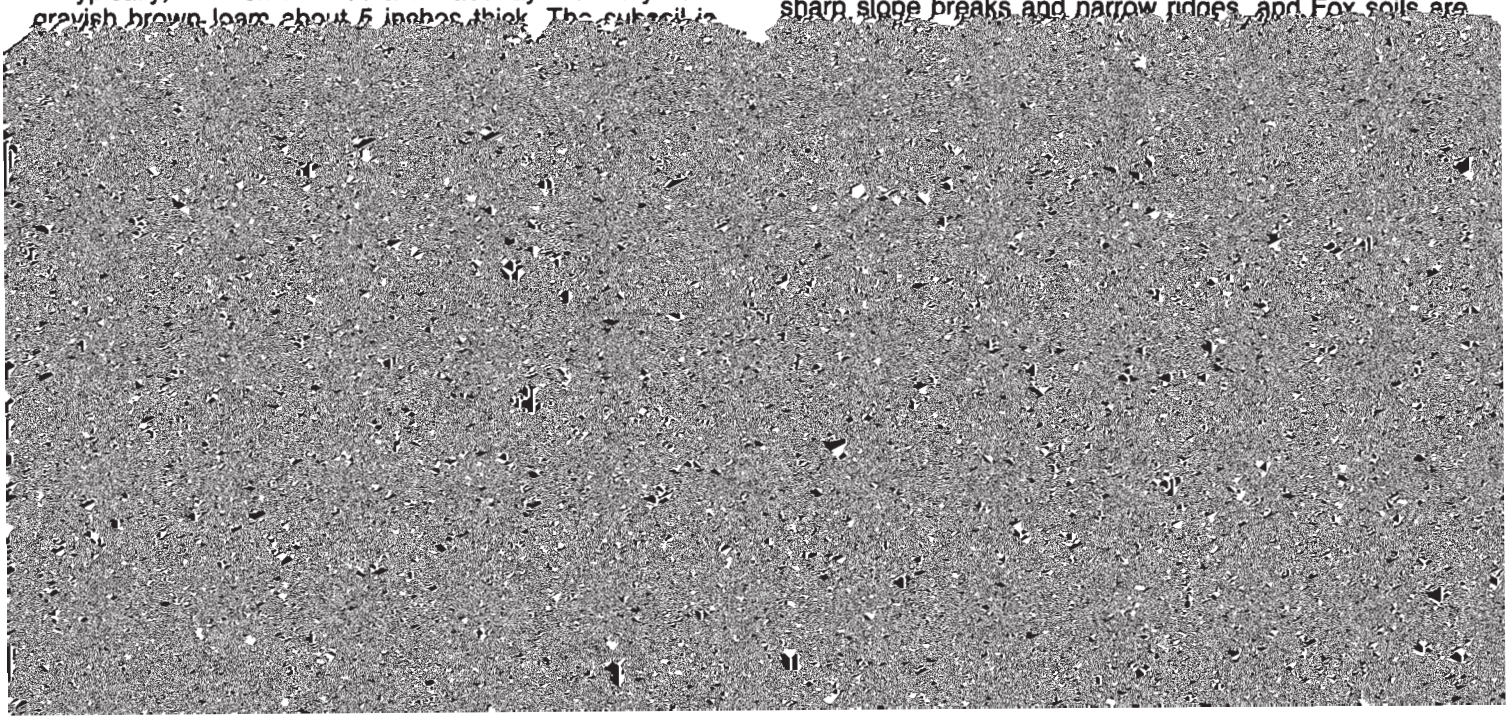
Pits, gravel is not assigned to a capability subclass.

919C—Rodman-Fox complex, 5 to 12 percent slopes. This complex consists of sloping, well drained and excessively drained soils on upland kames and eskers and on stream terrace breaks. Areas range from 2 acres to about 40 acres in size.

This map unit is about 40 to 55 percent Rodman soils and 30 to 40 percent Fox soils. Rodman soils are on sharp slope breaks and narrow ridges, and Fox soils are on broader ridges and lesser side slopes. Areas of the Rodman and Fox soils are so intricately mixed or so small in size that it is not practical to map them separately.

Typically, the Rodman soil has a surface layer of very dark brown gravelly loam about 10 inches thick. The substratum, to a depth of 60 inches, is dark yellowish brown, calcareous sand and gravel. In some places, calcareous sand and gravel are at the surface.

Typically, the Fox soil has a surface layer of very dark grayish brown loam about 5 inches thick. The subsoil is



These soils are suited to small grain and grass and legume hay and pasture. Because the root zone is shallow, corn and soybeans are particularly affected by drought during dry periods. If these soils are used for cultivated crops, further erosion is a hazard. Minimum tillage, contour farming, cover crops, and grassed waterways help prevent excessive soil loss.

Using these soils for woodland is effective in controlling erosion. Maintaining an adequate vegetative cover and ground mulch helps prevent excessive soil losses and improves the moisture supplying capacity of the soils by reducing runoff. A few areas remain in woodland.

These soils are only moderately suited to dwellings because of slope and the shrink-swell potential of the Fox soil. The slope is difficult to alter because of the depth to sand and gravel. The soils are only moderately suited to septic tank absorption fields because of slope; placing the fields on the contour helps to overcome this limitation. There is a hazard of effluent traveling long distances and polluting shallow underground aquifers. This hazard is somewhat less on Fox soils than on Rodman soils. The soils are a suitable source of sand and gravel.

This map unit is in capability subclass VIs.

919E—Rodman-Fox complex, 12 to 20 percent slopes. This complex consists of moderately steep, well drained and excessively drained soils on upland kames and eskers and on stream terrace breaks. Areas are linear in shape and range from 2 acres to about 30 acres in size.

This map unit is about 50 to 65 percent Rodman soils and 20 to 30 percent Fox soils. Rodman soils are on sharp slope breaks and narrow ridges, and Fox soils are

tain more silt and clay in the substratum than the Rodman and Fox soils. They make up 5 to 10 percent of the unit.

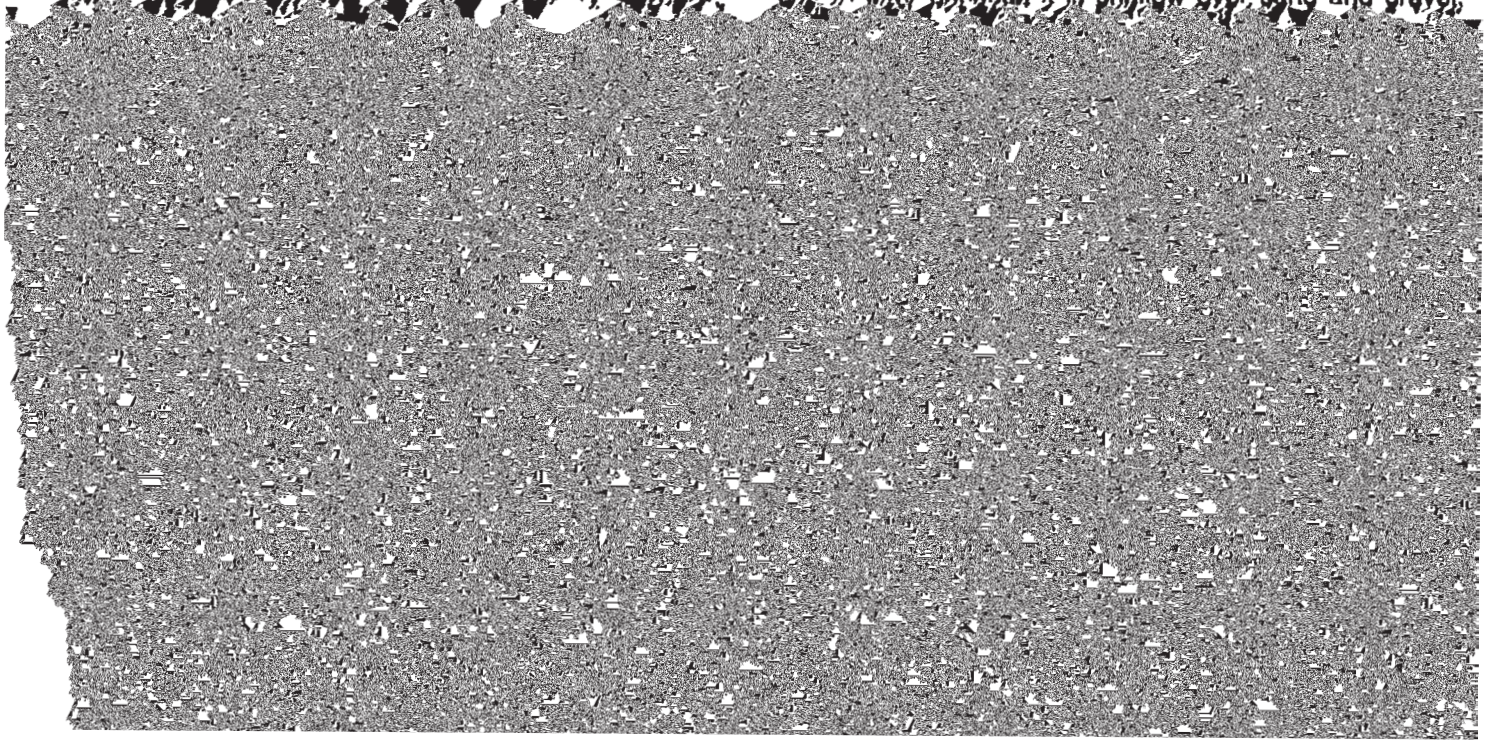
Permeability of the Rodman soil is very rapid in the subsoil. Permeabilty of the Fox soil is moderate in the subsoil and rapid in the substratum. Available water capacity of the Rodman soil is low. Available water capacity of the Fox soil is moderate in the subsoil and low in the substratum. In both soils, organic matter content is about 2 percent. Surface runoff is rapid. Rooting depth is restricted by calcareous sand and gravel. The shrink-swell potential of the Rodman soil is low, and that of the Fox soil is moderate.

The soils of this map unit are poorly suited to corn, soybeans, small grain, and hay. Steep slopes make seeding and harvesting difficult. Restricted rooting depth and limited available water capacity indicate severe droughtiness.

These soils are suited to woodland. Using these soils for woodland reduces erosion. Where possible, harvest cuttings should be light to leave the woodland intact. Careful felling, skidding, and hauling protect desirable uncut trees, seedlings, and shrubs. Care must be taken during harvesting because of the steep slopes.

These soils are poorly suited to dwellings and septic tank absorption fields because of slope. This limitation can be overcome, however, by cutting and shaping. There is a hazard of effluent traveling long distances and polluting shallow underground aquifers. Sanitary facilities should be part of a community treatment system. The soils are a source of sand and gravel.

This map unit is in capability subclass VIs.



2280: Rodman-Warsaw complex, 5 to 12 percent. [illegible] areas, the surface is thinner than typical and subsoil is mixed with the surface layer by plowing. In a few places, the surface layer contains more sand. Included are some areas where calcareous sand and gravel are between depths of 15 and 24 inches.

Included with these soils in mapping are small areas of well drained Jasper soils. These included soils contain more silt and clay in the substratum than the Rodman and Warsaw soils. They make up 2 to 5 percent of the unit.

Permeability of the Rodman soil is very rapid and of the Warsaw soil is moderate in the subsoil and very rapid in the substratum. Available water capacity of the Rodman soil is low and of the Warsaw soil is moderate. In both soils the surface layer is about 3 percent organic matter. Surface runoff from cultivated areas is medium. Rooting depth is restricted by calcareous sand and gravel. The shrink-swell potential is low.

This map unit is best suited to small grain and grass and legume hay and pasture. Because the root zone is shallow, corn and soybeans are particularly affected by drought during dry periods. If these soils are used for cultivated crops, erosion is a hazard. Minimum tillage, contour farming, cover crops, and grassed waterways help prevent excessive soil loss.

Using these soils for pasture or hay crops is effective in controlling erosion. Maintaining an adequate vegetative cover and ground mulch helps prevent excessive soil losses and improves the moisture supplying capacity by reducing runoff. Proper stocking and a planned grazing system keep the pasture and soil in good condition.

These soils are only moderately suited to dwellings because of slope. The slope of the Rodman soil is difficult to alter because it is shallow over sand and gravel,

stratum, to a depth of 60 inches, is dark yellowish brown, calcareous sand and gravel. In some places, calcareous sand and gravel are at the surface.

Typically, the Warsaw soil has a surface layer of very dark brown loam about 6 inches thick. The subsurface layer is very dark brown and very dark grayish brown loam about 8 inches thick. The subsoil is about 18 inches thick. The upper part is brown, friable clay loam, and the lower part is dark reddish brown gravelly loam. The substratum, to a depth of about 60 inches, is yellowish brown, moderately alkaline sand and gravel. In some places the surface layer is light colored, and in a few areas it contains more sand. In some areas, exposed sandy loam glacial till is indicated on the soil map by the symbol for till spots.

Included with these soils in mapping are small areas of well drained Jasper soils. These included soils contain more silt and clay in the substratum than the Rodman and Warsaw soils. They make up 2 to 4 percent of the unit.

Permeability of the Rodman soil is very rapid and of the Warsaw soil is moderate in the subsoil and very rapid in the substratum. Available water capacity of the Rodman soil is low and of the Warsaw soil is moderate. In both soils the surface layer is about 3 percent organic matter. Surface runoff is medium. Rooting depth is restricted by calcareous sand and gravel. The shrink-swell potential is low.

Using these soils for pasture is effective in controlling erosion. Proper stocking and a planned grazing system keep the pasture and soil in good condition.

These soils are poorly suited to dwellings and septic tank absorption fields because of slope and the permeable underlying material. Cutting and shaping the soils help overcome the slope limitation. If effluent travels long distances, there is a hazard of pollution to shallow underground aquifers. Sanitary facilities must be connected to community treatment facilities. The soils are a source of sand and gravel.

This map unit is in capability subclass VIs.

4776—Comfrey clay loam, ponded. This nearly level ton, Selma, and Comfrey soils are on similar positions on the landscape. Orion soils are adjacent to Comfrey soil and slightly higher on the landscape. Also included are very poorly drained muck or peat soils.

This Comfrey soil has moderate permeability. Surface runoff is slow to very slow or the soil is ponded, and available water capacity is high. A seasonal high water table is at or near the surface. The surface layer is about 7 percent organic matter. The soil is neutral or mildly alkaline.

This soil is not suited to corn, soybeans, small grain, and grass and legume hay and pasture unless it is drained and protected from flooding. It requires artificial drainage to reach maximum potential when used for cultivated crops. A system of subsurface drains and surface ditches helps if suitable outlets are available. A levee or dike system helps protect some areas from overflow.

Some areas of this soil are used for pasture. Overgrazing when the soil is wet causes compaction and lower pasture quality. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods keep pasture and soil in good condition.

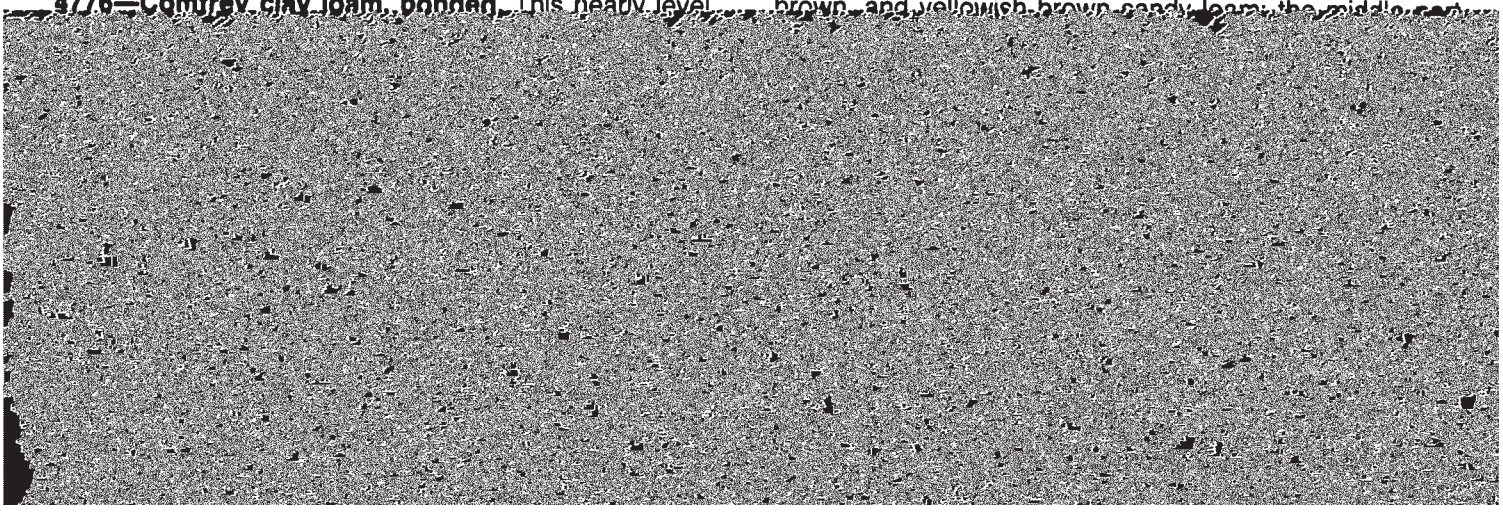
This soil is suited to wetland wildlife habitat. Birds and mammals have access to a large variety of wetland plants and shallow water areas on this soil. Restraint from artificial drainage promotes better conditions for wetland wildlife habitat.

This soil is generally not suited to dwellings and septic tank absorption fields because of the ponding, seasonal high water table, and flooding.

This soil is in capability subclass VIw.

6506B—Hitt Variant, sandy loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on convex upper side slopes and tops of ridges on uplands. Areas are irregular in shape and range from 2 to 60 acres in size.

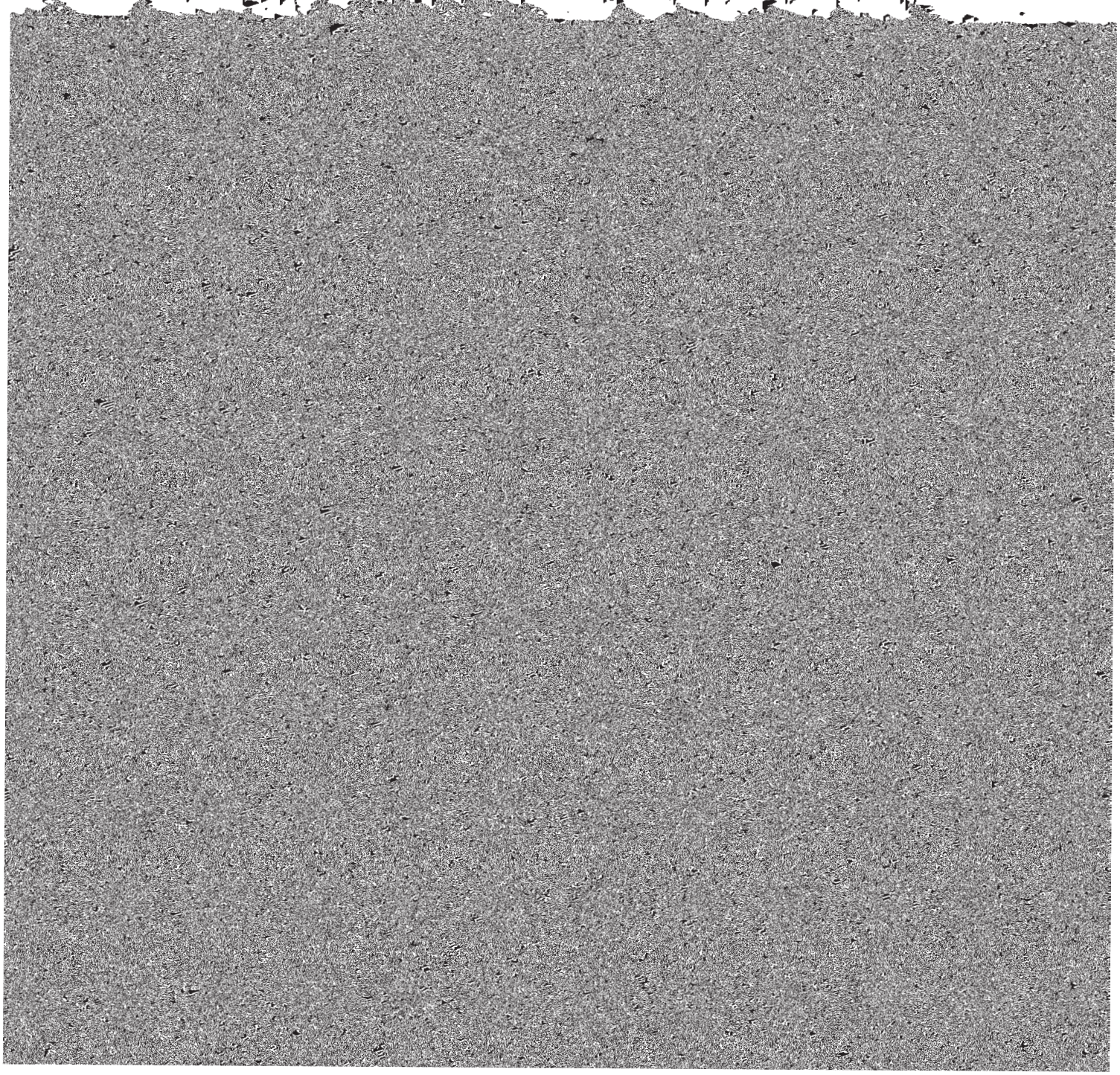
Typically, the surface layer is very dark gray sandy loam about 6 inches thick. The subsurface layer is very dark gray sandy loam about 9 inches thick. The subsoil is about 29 inches thick. The upper part is dark brown, brown, and yellowish brown sandy loam; the middle part



slightly acid. The shrink-swell potential is moderate in the subsoil.

This soil is suited to row crops, hay, and pasture. If used for cultivated crops, damage by water erosion is a hazard. Minimum tillage, contour farming, cover crops, and grassed waterways help prevent excessive soil loss. Returning crop residue to the soil or regular additions of other organic material improves fertility, reduces crusting, and increases water infiltration.

This soil is only moderately suited to dwellings because the shrink-swell potential and depth to bedrock are limitations. Foundations, however, can be designed to overcome the shrinking and swelling of the soil. Dwellings with basements require excavation of the bedrock in places. The soil is generally not suited to septic tank absorption fields because of slow permeability in the lower part and depth to bedrock. Sanitary facilities must be connected to community sanitary treatment facilities.



tion Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Soil maps for detailed planning." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

More than 440,954 acres in the survey area were used for crops and pasture in 1974, according to the 1974 Census of Agriculture. Of this total 14,713 acres were used for permanent pasture; 280,000 acres for row crops, mainly corn and soybeans; 47,845 acres for close-grown crops, mainly wheat, oats, rotation hay and pasture and other crops. The remaining 50,000 acres were used for vegetable crops. Much of the rotation hay and pasture has been converted to cropland because of the increased emphasis on row crop production.

The potential of the soils in the survey area for increased production of food is very good. A very limited number of acres of potentially good cropland are currently being used as woodland or pasture. Food production could be increased considerably by the reserve productive capacity represented by this land and by extending the latest crop production technology to all cropland in the county. This soil survey can greatly facilitate the application of such technology.

Soil erosion is the major soil problem on about 71 percent of the cropland and pasture in the survey area. If the slope is more than 2 percent, erosion is a hazard. Ashdale, Fayette, Flagg, Griswold, and Tama soils, for example, have slopes of 2 to 5 percent, and are easily eroded.

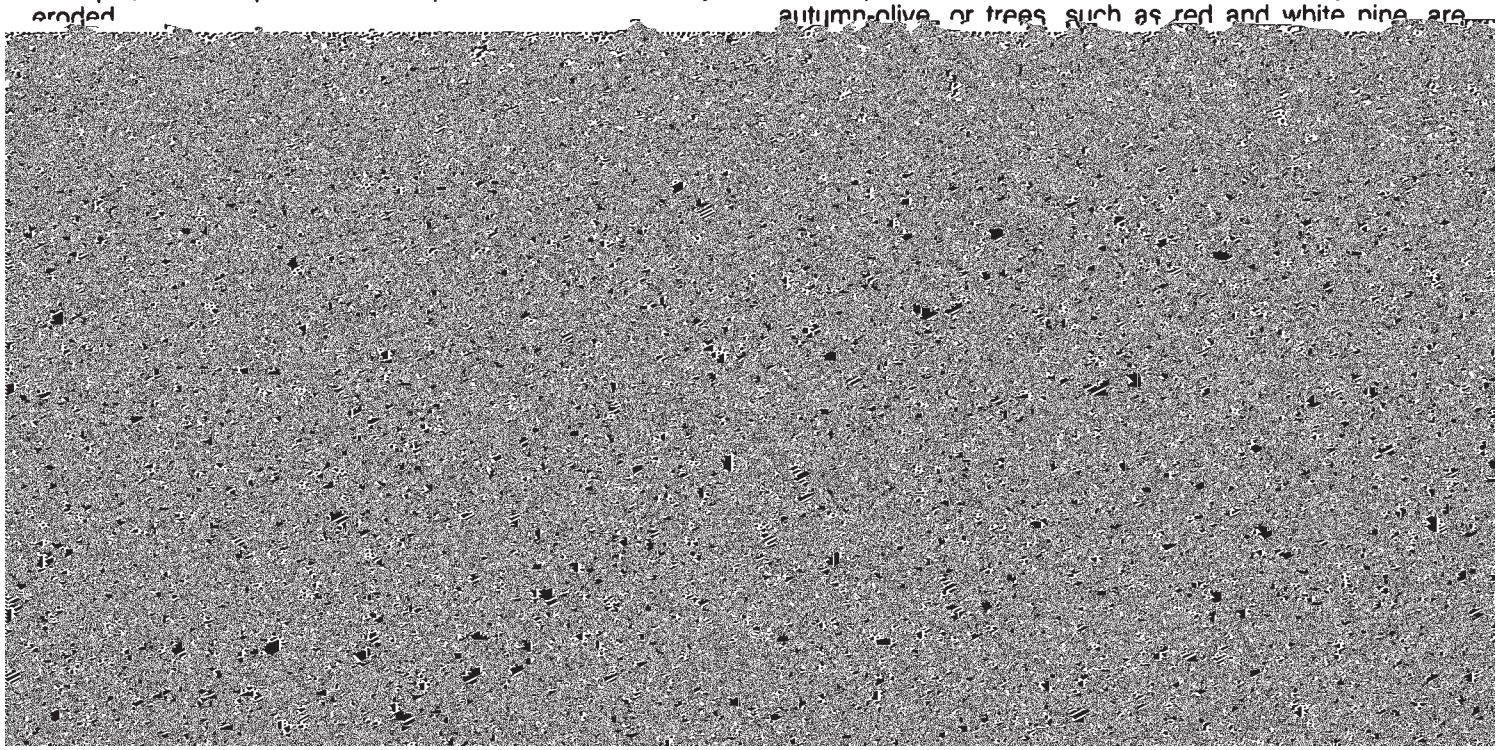
hay, the legume and grass forage crops in the cropping system reduce erosion on sloping land and also provide nitrogen and improve tilth for the following crop.

On some areas of the strongly sloping Dunbarton, Fayette, Kidder, Martinsville, Miami, Pecatonica, Sogn, Whalan and Westville soils, slopes may be too short or irregular for contour tillage or terracing to be practical. In these areas, such conservation practices as cropping systems that provide substantial vegetation cover, conservation tillage, and crop residue management, are required to control erosion.

Terraces and diversions reduce the length of slope and reduce runoff and erosion. They are most practical on deep, well drained soils that have regular slopes. Tama, Fayette, and Downs soils are very suitable for terraces. Some other soils are less suitable for terracing and diversions because of irregular slopes, excessive wetness in the terrace channels, a clayey subsoil that would be exposed in terrace channels, or bedrock at a depth of less than 40 inches.

Contour farming and terracing are widespread erosion control practices in the survey area. They are best adapted to soils that have smooth, uniform slopes but can often be successfully used on the slopes that are not uniform.

Soil blowing is a hazard on the sandy Chelsea, Dickinson, Lamont, and Sparta soils. Soil blowing can damage these soils in a few hours if winds are strong and the soils are dry and bare of vegetation or surface mulch. Maintaining vegetative cover, surface mulch, or rough surfaces through proper conservation tillage methods minimizes soil blowing on these soils. Field windbreaks of adapted shrubs, such as Tatarian honeysuckle or autumn-olive, or trees, such as red and white pine, are

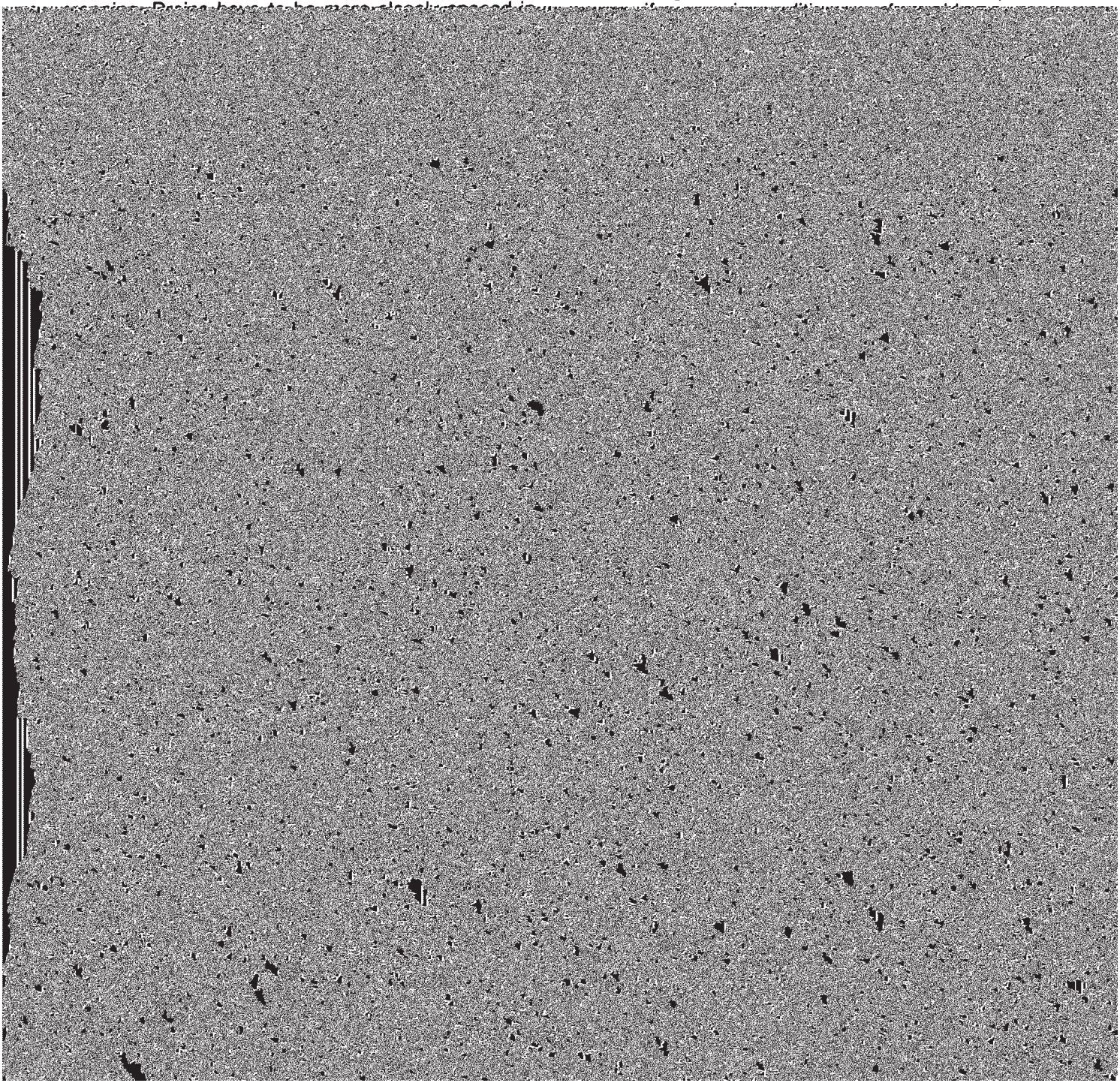


ageways and in swales are commonly included in areas of the well drained or moderately well drained Downs, Fayette, Flagg, Jasper, Ogle, Parr, Plano, Tama, and Varna soils, that have slopes of 2 to 5 percent. Artificial drainage is needed in some of these wetter areas.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and subsurface drainage is needed in most areas of the poorly drained soils used for intensive

often stay wet until late in spring. If they are wet when plowed, they tend to be very cloddy when dry and good seedbeds are difficult to prepare. Fall plowing generally results in good tilth in the spring. Fall chisel plowing is generally as effective as moldboard plowing.

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 major row crops. Grain sorghum, sunflowers, and similar crops can be



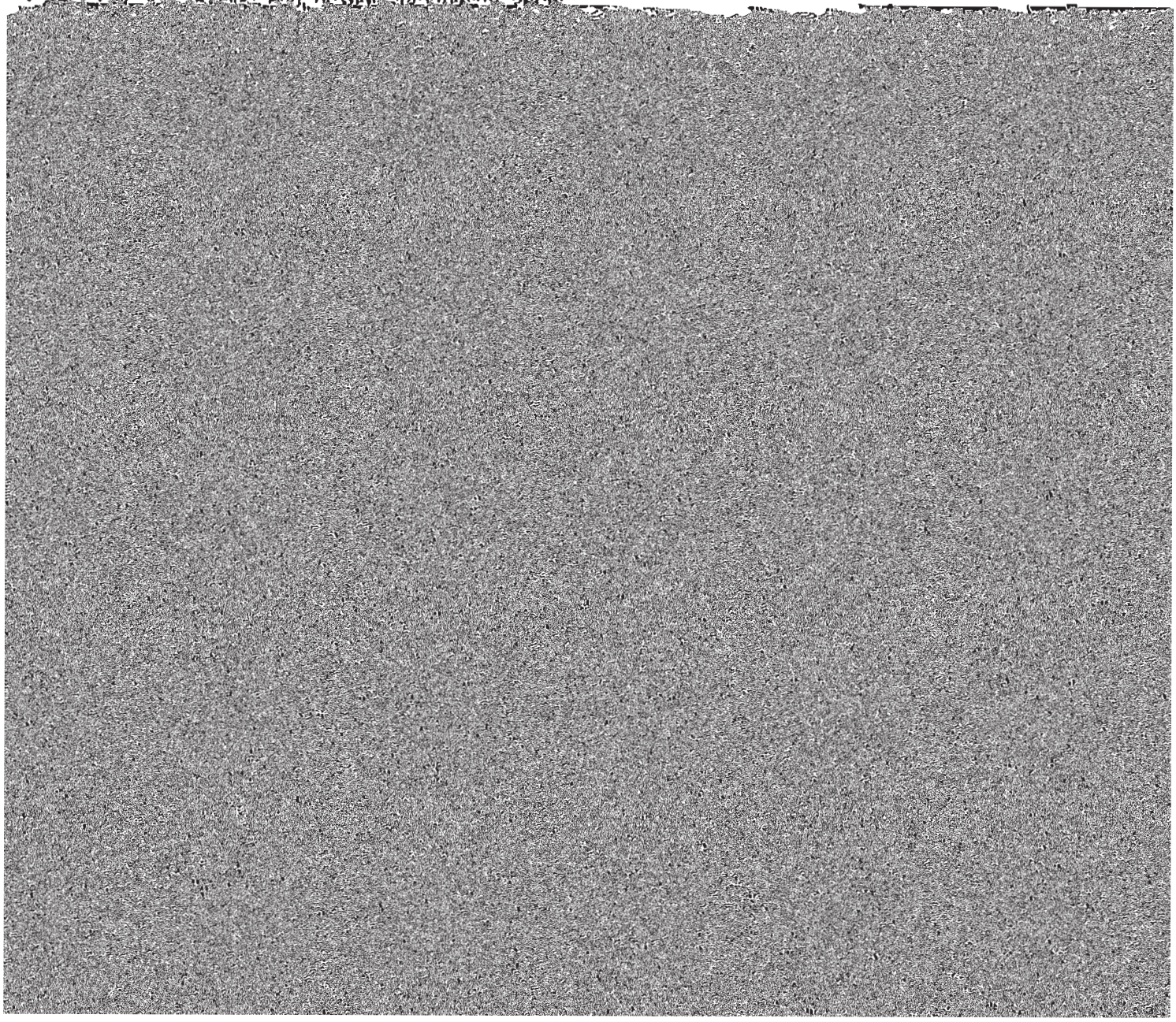
and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

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

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

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



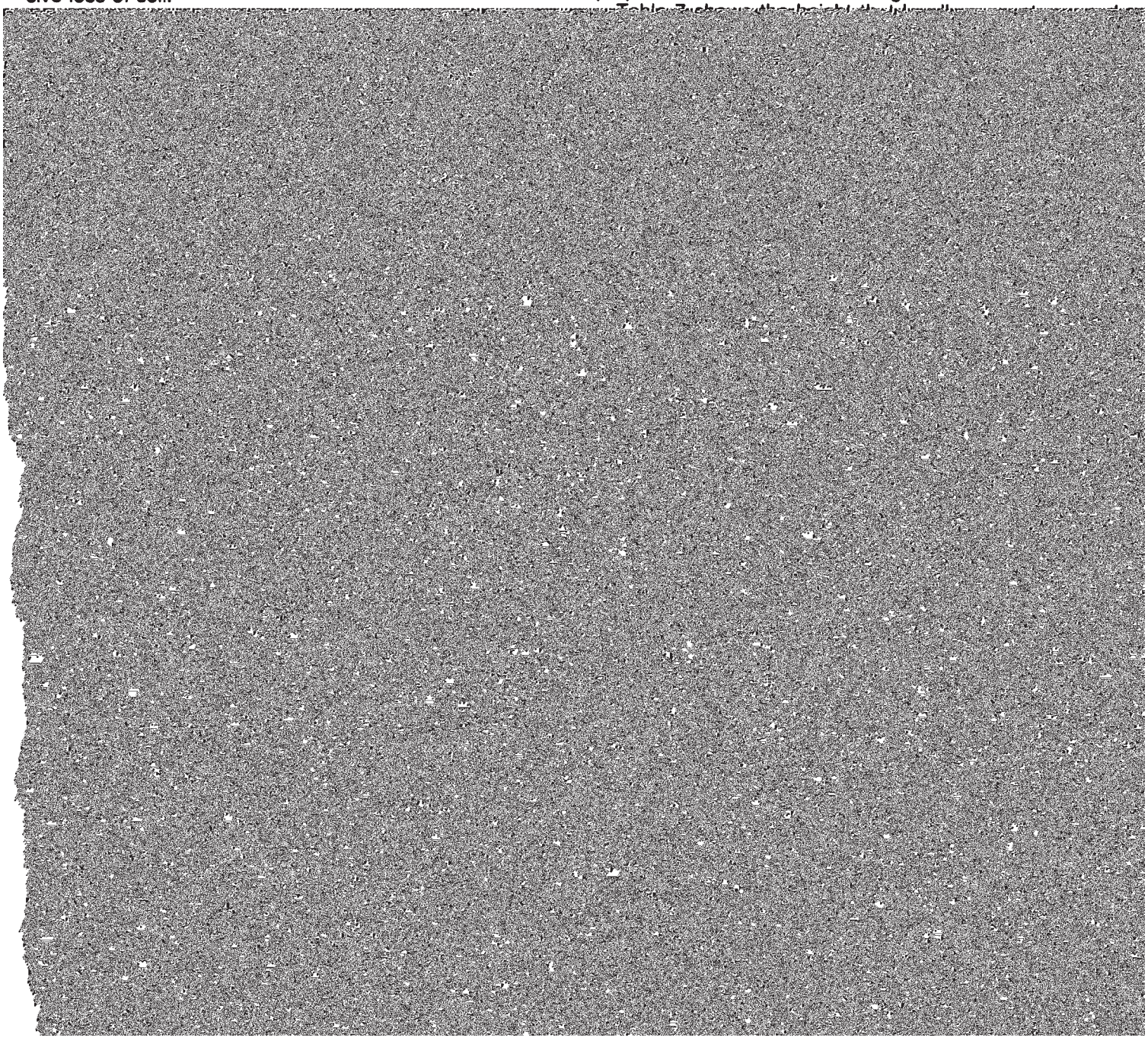
more than one limitation, the priority is as follows: w, d, s, and r.

In table 6, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if 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 loss of soil.

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, hold 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 insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.



and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

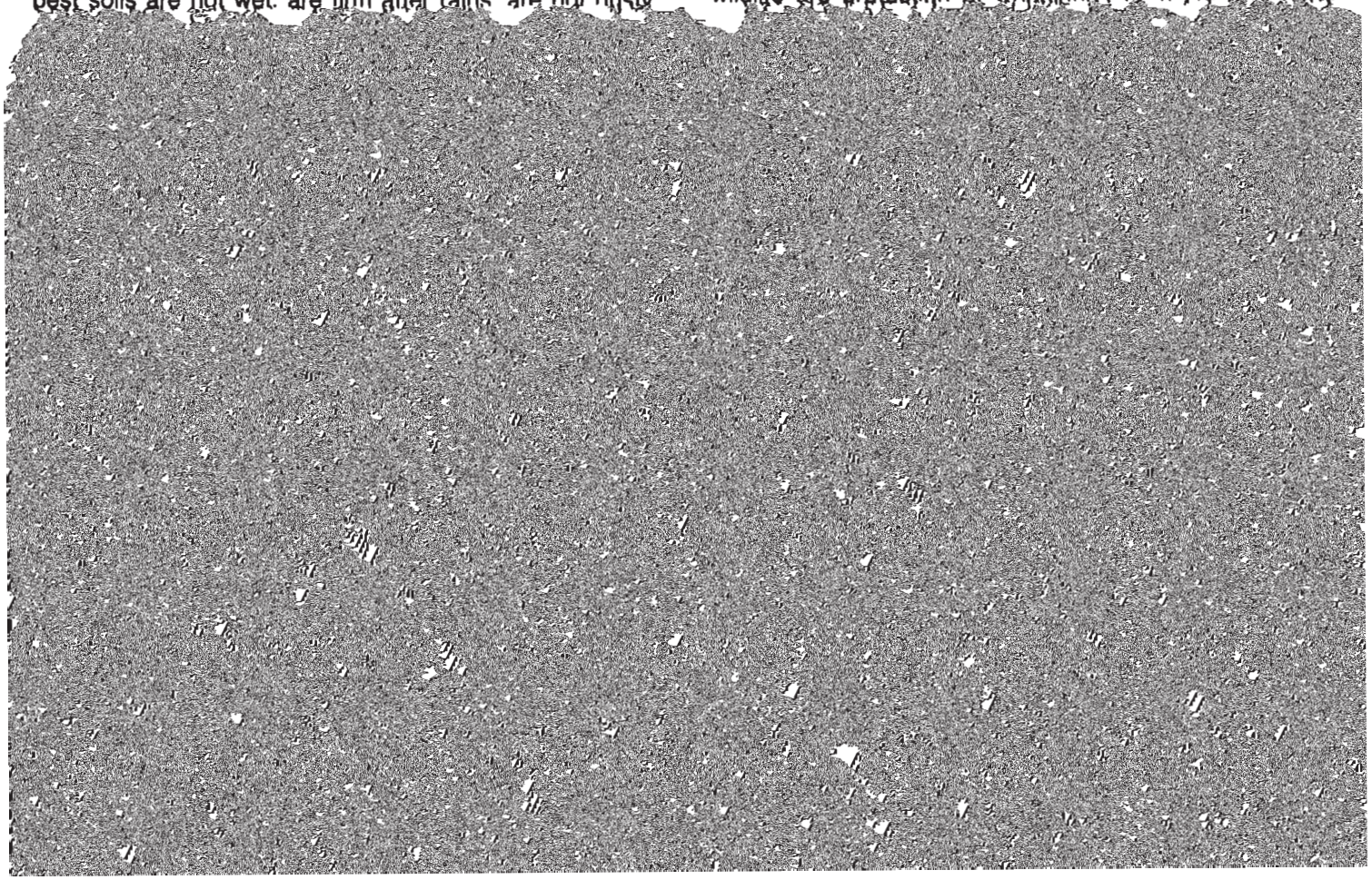
Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty

generally poor in quality because of lack of crop residues, herbaceous nesting and roosting cover, woody cover, and travel lanes or hedgerows. Wildlife of this area consists chiefly of ring-necked pheasant, raccoon, and occasional deer, and such nongame species as the horned lark, meadow lark, grasshopper sparrow, fox snake, and others adapted to prairie or open habitats. Practices that would benefit wildlife in this area are delayed mowing of grassy cover in roadsides, ditchbanks, and waterways until after the nesting season, protection of existing woody cover, and crop residue management.

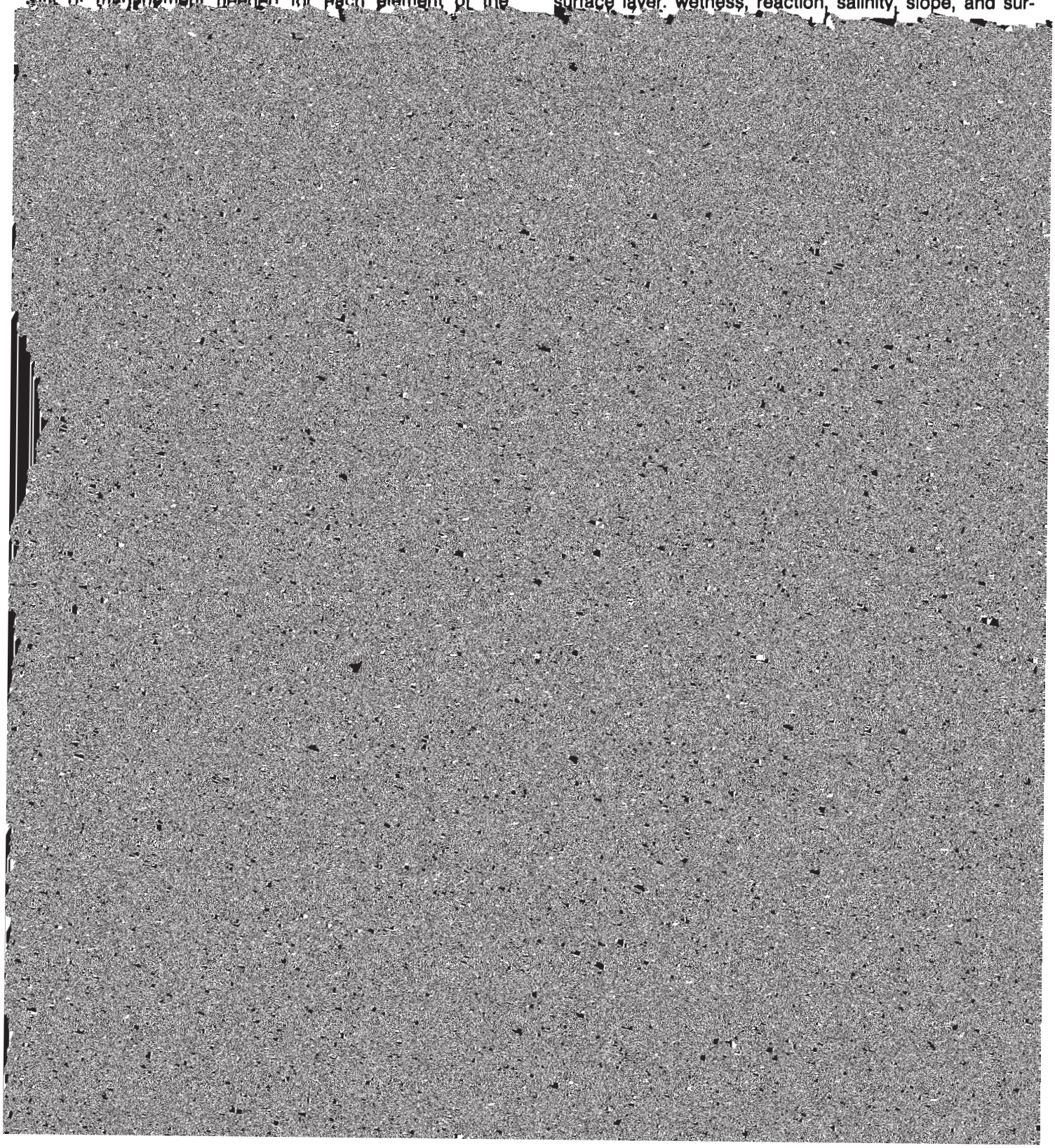
Wildlife Area 2. This wildlife area is on the Pecatonica-Flagg-Westville, Boone-Eleva-Chelsea, and Martinsville-Whalan-Rockton associations. Soils are nearly level to very steep and range from well drained to excessively drained.

Major land uses in this area are cropland, pasture and hayland, and woodland. The diversity of land uses provides habitat for a good variety of wildlife. Major game species are ring-necked pheasant, white-tailed deer, fox and gray squirrels, mourning dove, and rabbit. Other wildlife in this area include bobwhite quail, fox, raccoon, skunk, and other furbearers and nongame birds and mammals. Management practices of greatest benefit to wildlife are protection of woodlands from fire and graz-



able for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the

or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and sur-



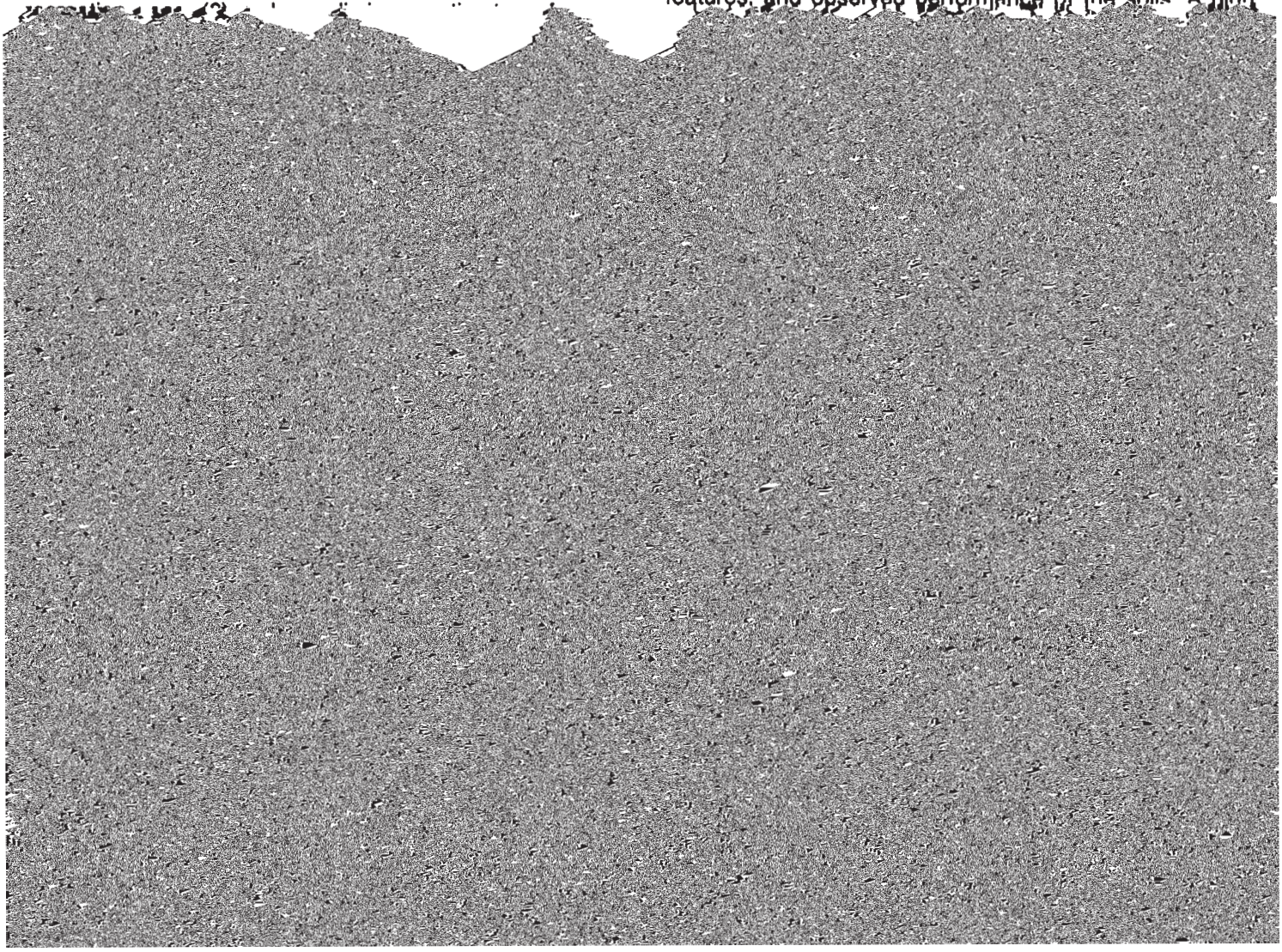
Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and

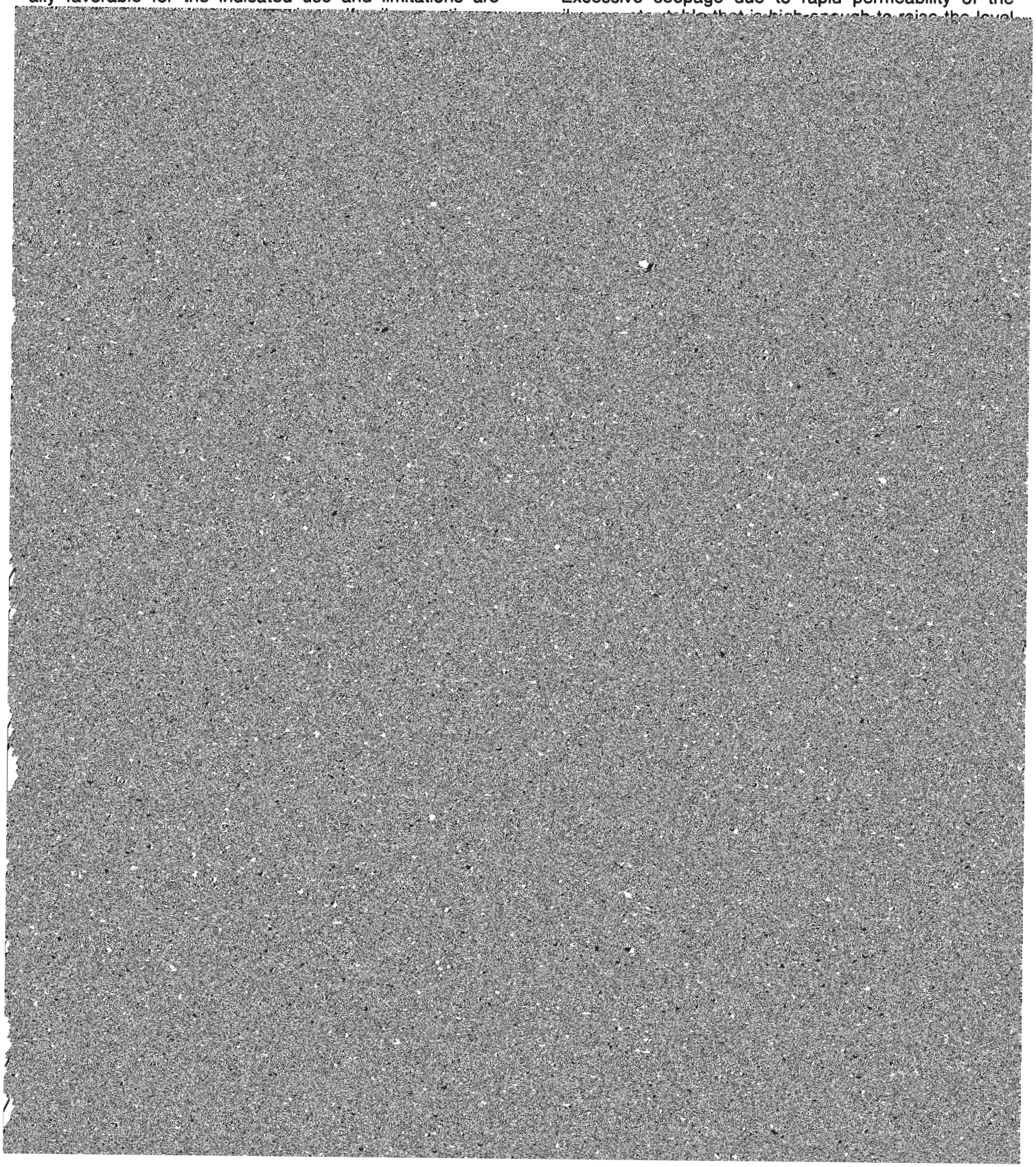
Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high



ally favorable for the indicated use and limitations are

Excessive seepage due to rapid permeability of the



good, fair, or *poor* as a source of these materials. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

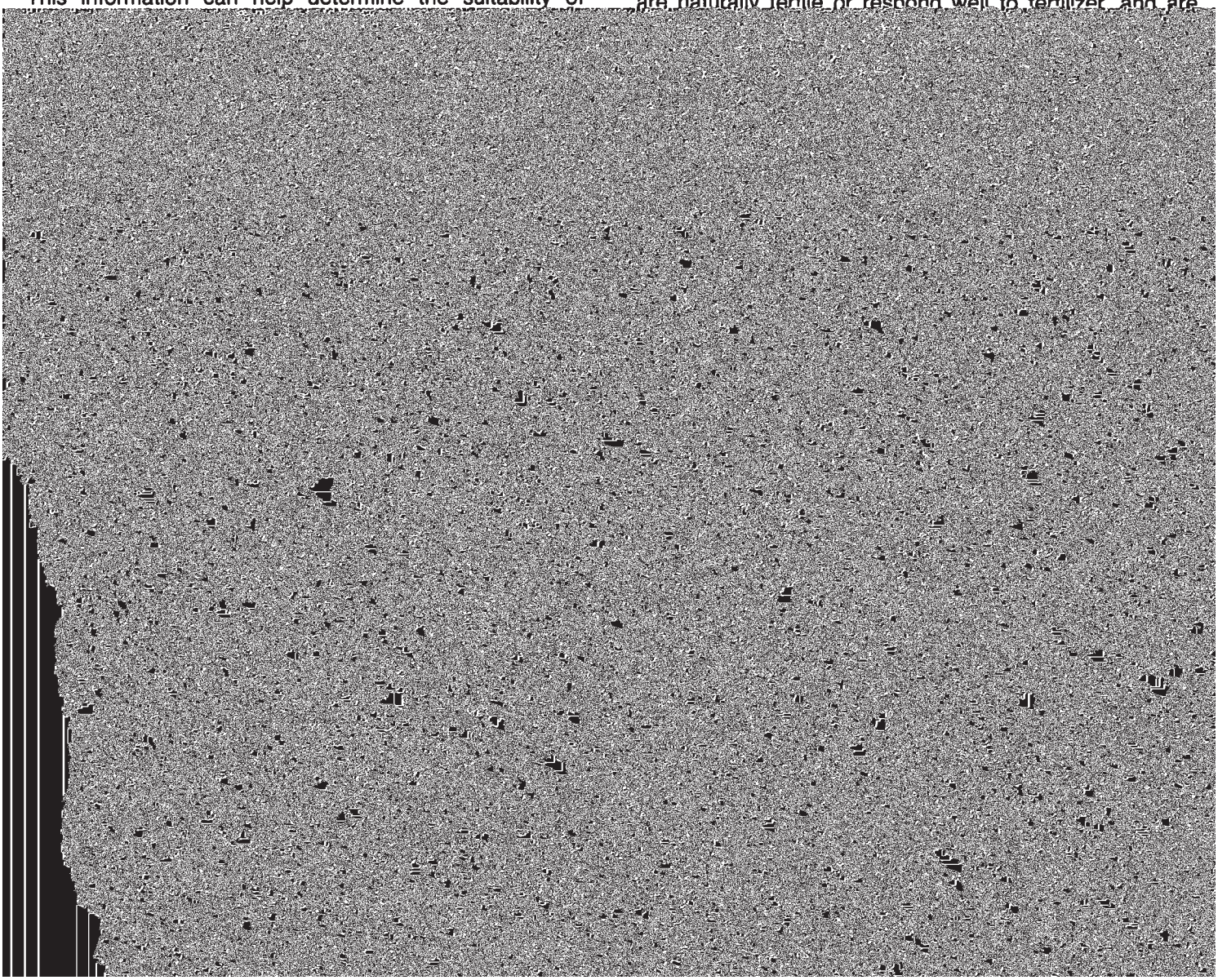
Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of reaction, and stratification are given in the soil series descriptions and in table 14.

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.

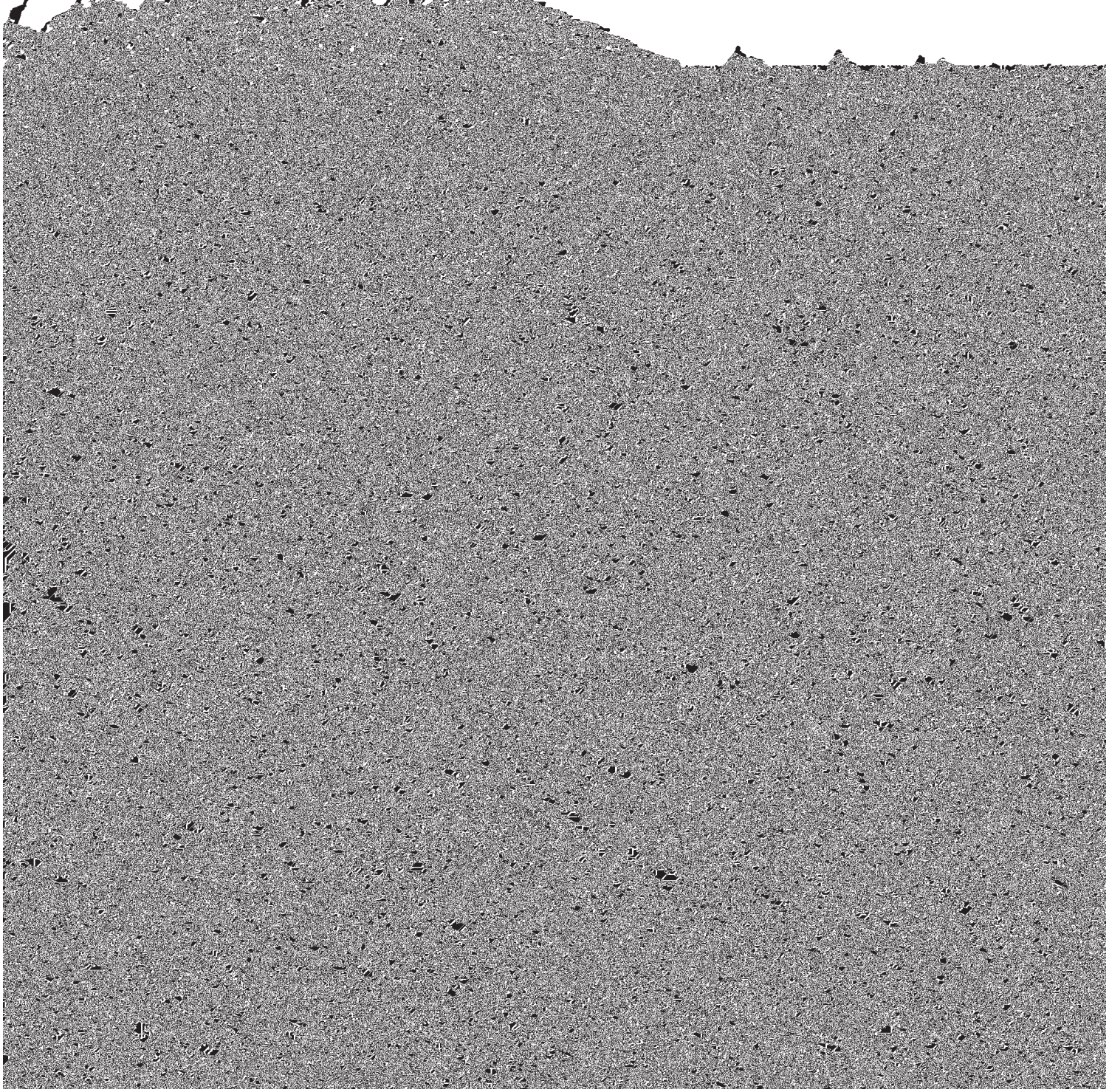
Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow 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



depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of



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 bench-

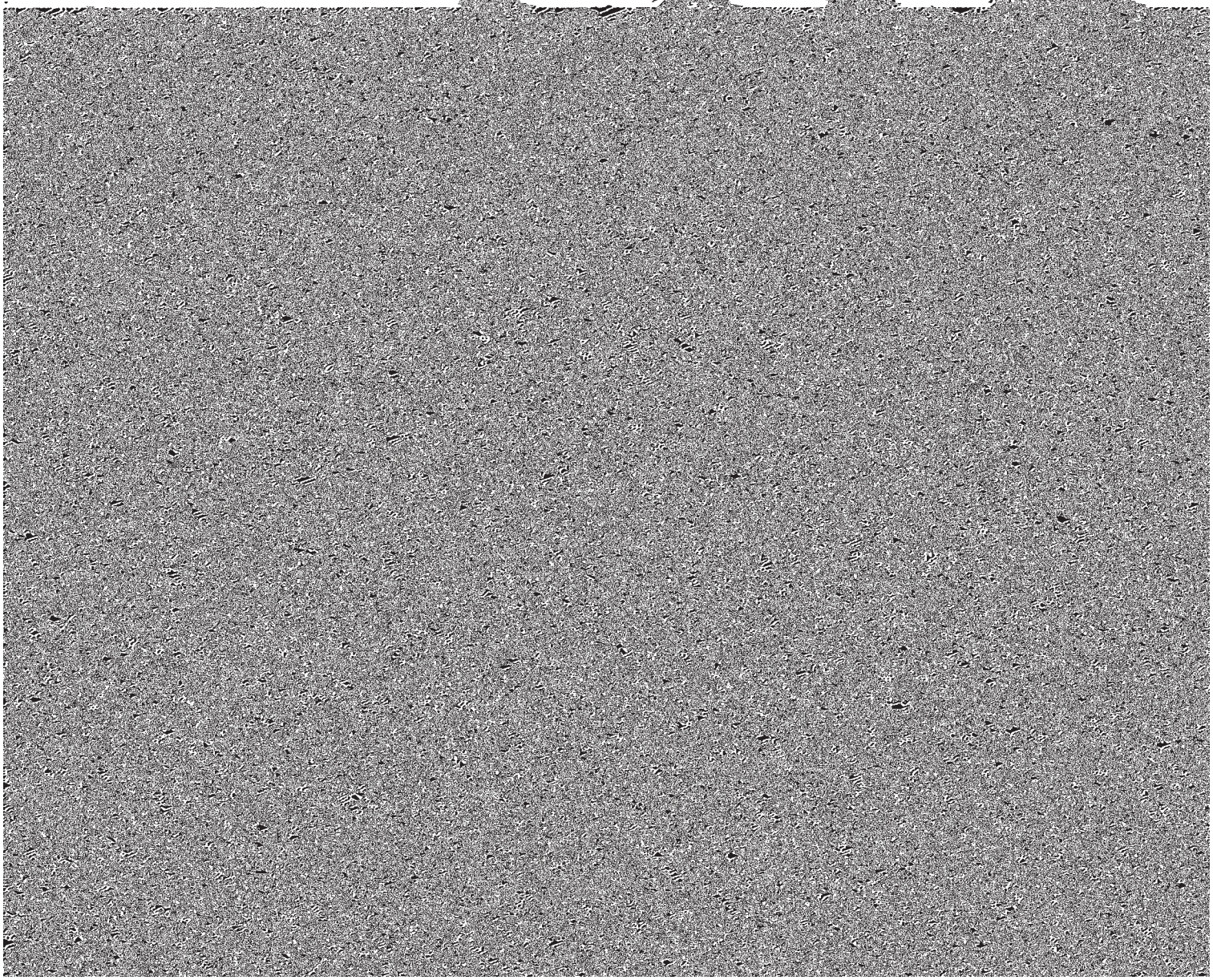
CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

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-

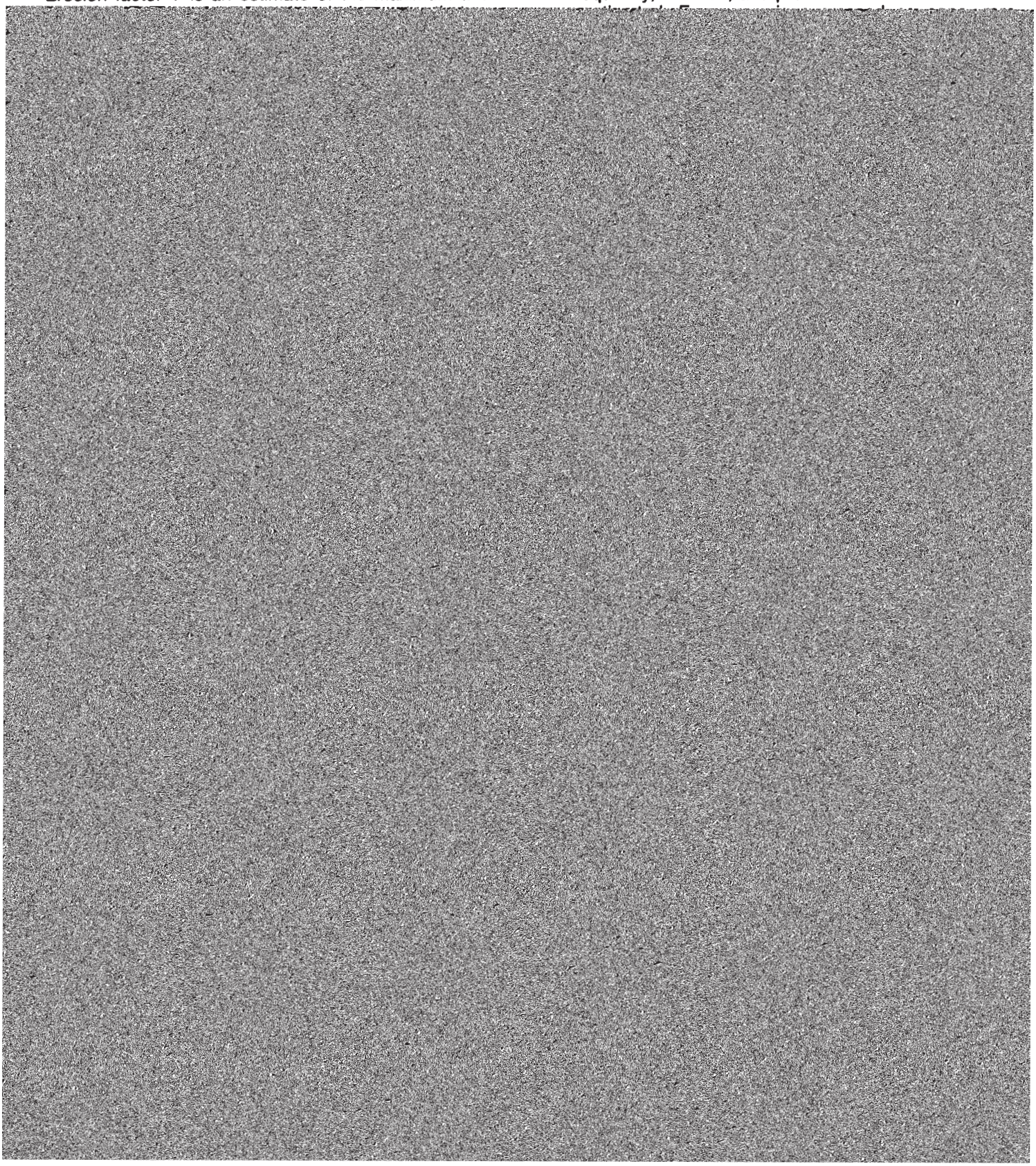
considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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



Erosion factor T is an estimate of the maximum aver-

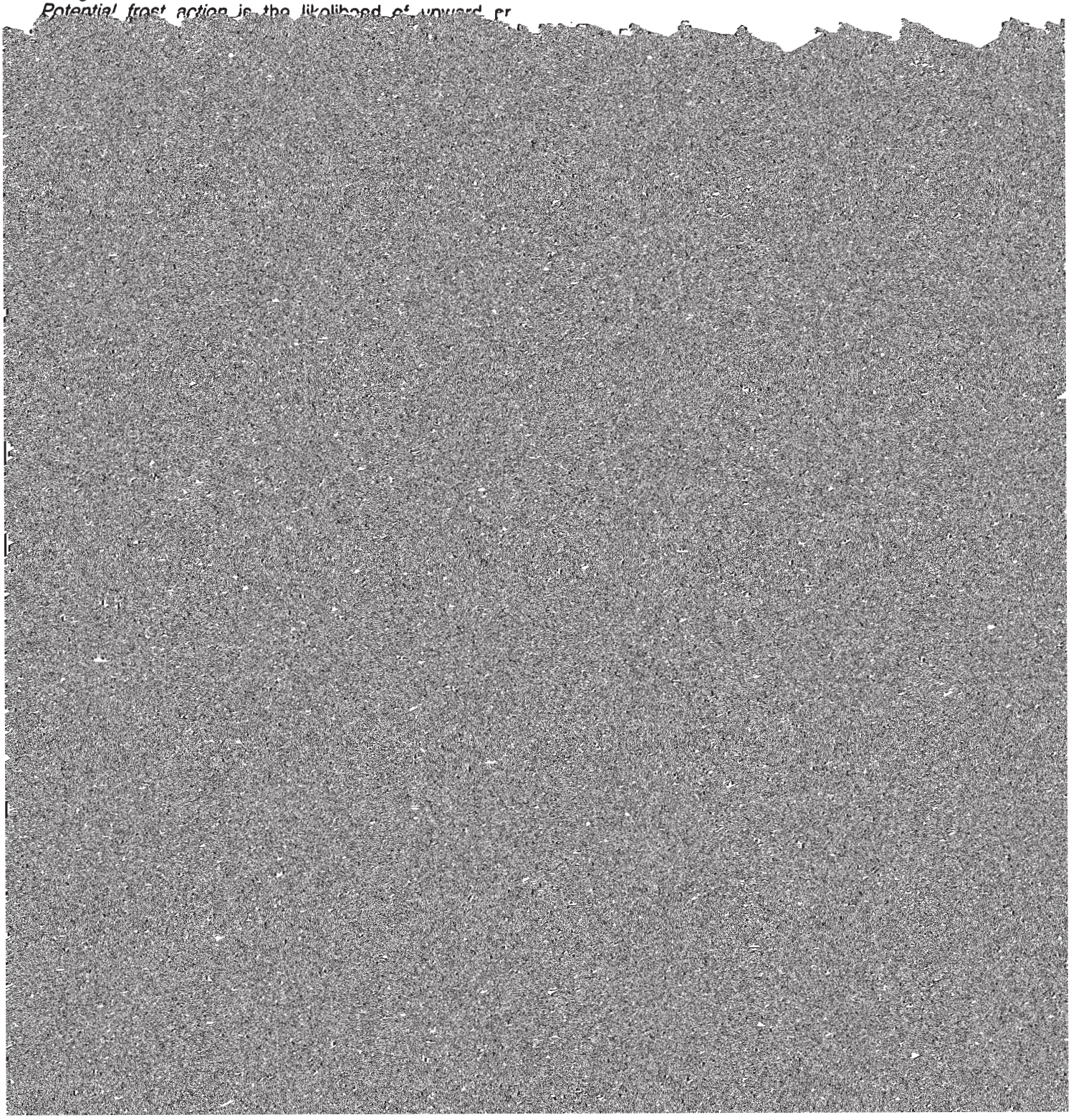
Frequency, duration, and probable dates of occurrence



kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Potential frost action is the likelihood of upward or

D2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).



(10YR 3/3) clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—22 to 31 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure parting to moderate very fine and fine subangular blocky; friable; few roots; thin continuous

areas, the surface layer, which ranges from 6 to 9 inches in thickness, is thinner than defined for the series, but this difference does not alter the use or behavior of the soils.

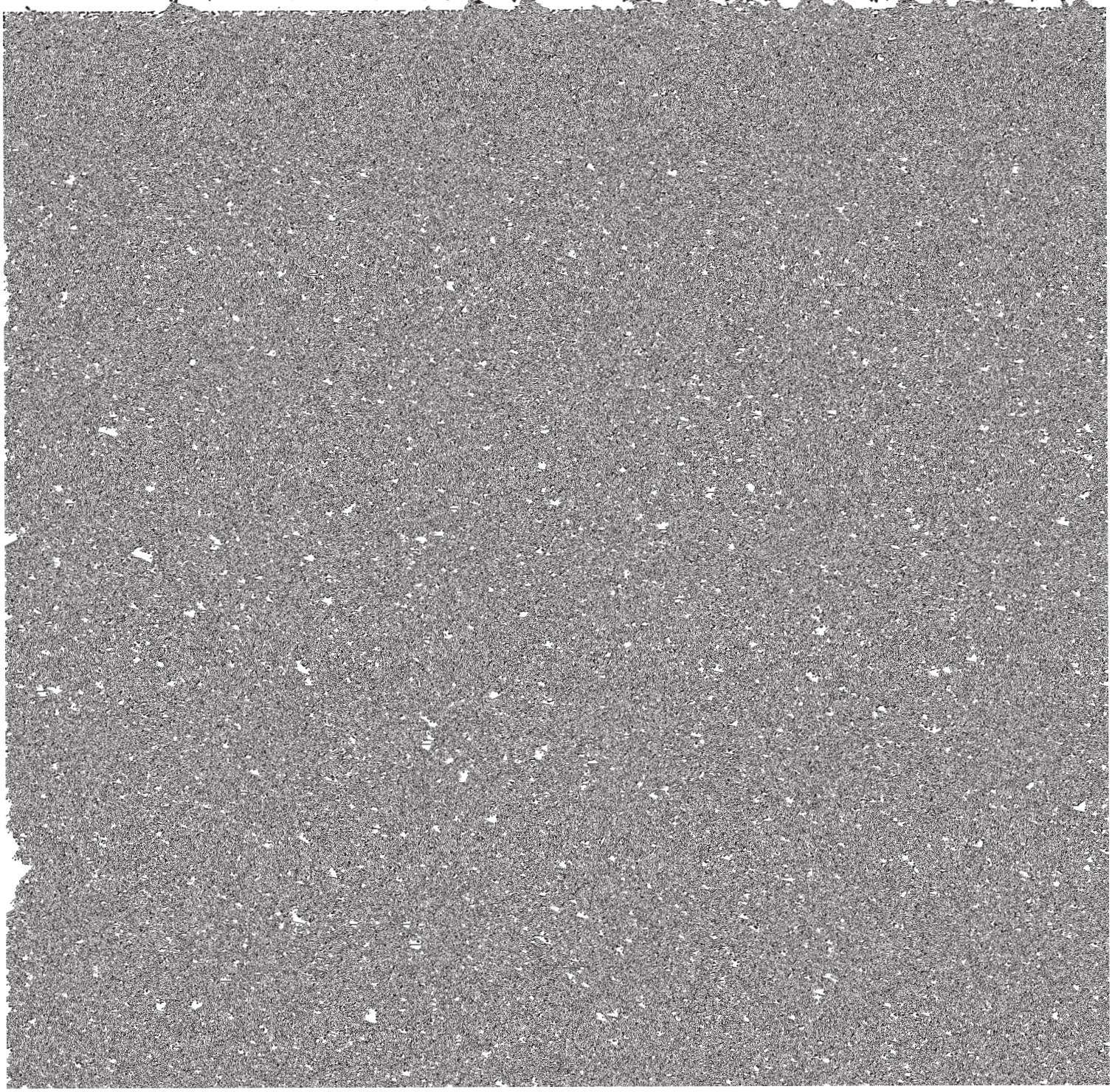
Assumption soils are similar to and are near the Muscatine, Ogle, and Tama soils. Muscatine soils are some-

The solum ranges from about 4 to 7 feet or more in thickness.

The A horizon ranges from 6 inches to about 9 inches in thickness. It has color value of 2 or 3 and chroma of 1 through 3. The part of the B2 horizon that formed in silty material has color value of 4 or 5 and chroma of 3 through 6. The IIB horizon has hue of 5Y, 2.5Y, or 10YR; value of 3 through 5; and chroma of 1 or 2. Uncoated silt

ing to moderate medium subangular blocky; friable; few roots; thin discontinuous dark brown (10YR 4/3) clay films on faces of peds; several large pebbles more than 1 inch in diameter; 6 percent pebbles; stone line at a depth of about 33 inches; slightly acid; clear smooth boundary.

B23t—36 to 39 inches; dark brown (7.5YR 4/4) sandy clay loam; strong medium prismatic structure; firm;



ture; friable; common roots; layer compacted because of tillage; medium acid; abrupt smooth boundary.

A2—6 to 13 inches; dark grayish brown (10YR 4/2) silt loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak thin platy structure parting to moderate fine granular; friable; common roots; few fine dark concretions (iron and manganese oxides); medium acid; clear smooth boundary.

B1t—13 to 19 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak thin platy structure parting to moderate fine granular; friable; common roots; thin discontinuous very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine dark concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

B21t—19 to 25 inches; olive (5Y 5/3) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few roots; thin continuous grayish brown (2.5Y 5/2) clay films on faces of peds; few fine dark concretions (iron

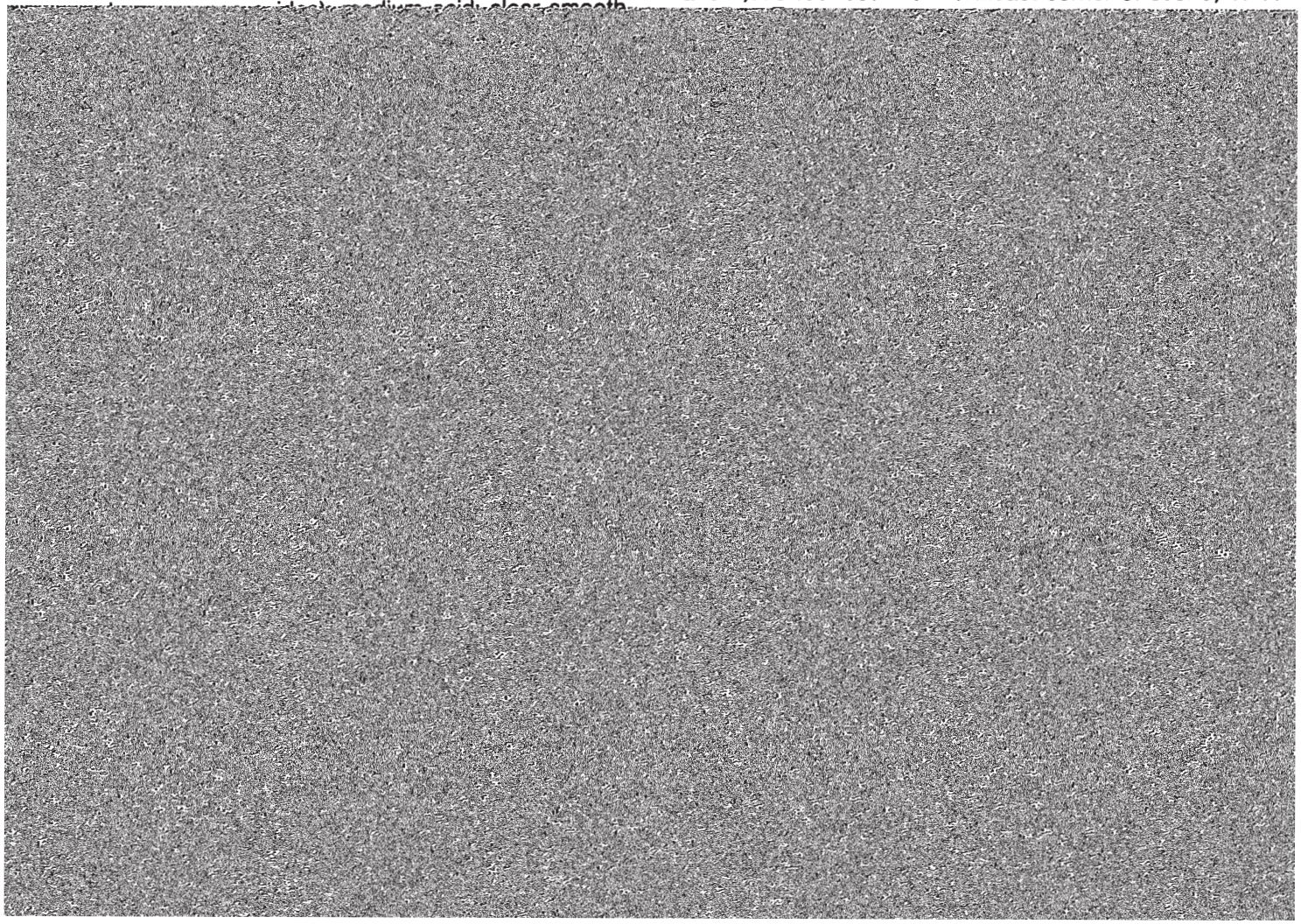
The A1 or Ap horizon has color value of 2 or 3 and chroma of 1 or 2. The B horizon has hue of 10YR, 2.5Y, or 5Y; value of 4 through 6; and chroma of 2 through 4.

Batavia series

This series consists of moderately well drained soils that have moderate permeability. These soils formed in 40 to 55 inches of loess over stratified outwash. They formed under prairie grasses and trees on outwash plains and stream terraces. Slope ranges from 1 to 5 percent.

Batavia soils are similar to Plano soils and are near the Elburn, Kendall, Martinsville, and St. Charles soils. Plano soils have a mollic surface layer. Elburn and Kendall soils are somewhat poorly drained. Martinsville soils are fine and loamy. St. Charles soils have a thinner or lighter colored Ap horizon and a more prominent A2 horizon.

Typical pedon from an area of Batavia silt loam, 1 to 5 percent slopes, on a loess covered outwash plain about 1 1/2 miles southeast of Lindenwood, 1,364 feet west and 1,073 feet south of northeast corner of sec. 9, T. 41



brown (10YR 3/3) clay films on vertical faces of peds; strongly acid; abrupt smooth boundary.

IIB32t—46 to 52 inches; dark yellowish brown (10YR 4/4) stratified loam, clay loam, and silt loam; weak coarse prismatic structure; friable; thin discontinuous dark grayish brown (10YR 4/2) clay films on faces of peds; strongly acid.

IIC—52 to 60 inches; dark grayish brown (10YR 4/4) stratified loam, clay loam, and silt loam; massive; friable; medium acid.

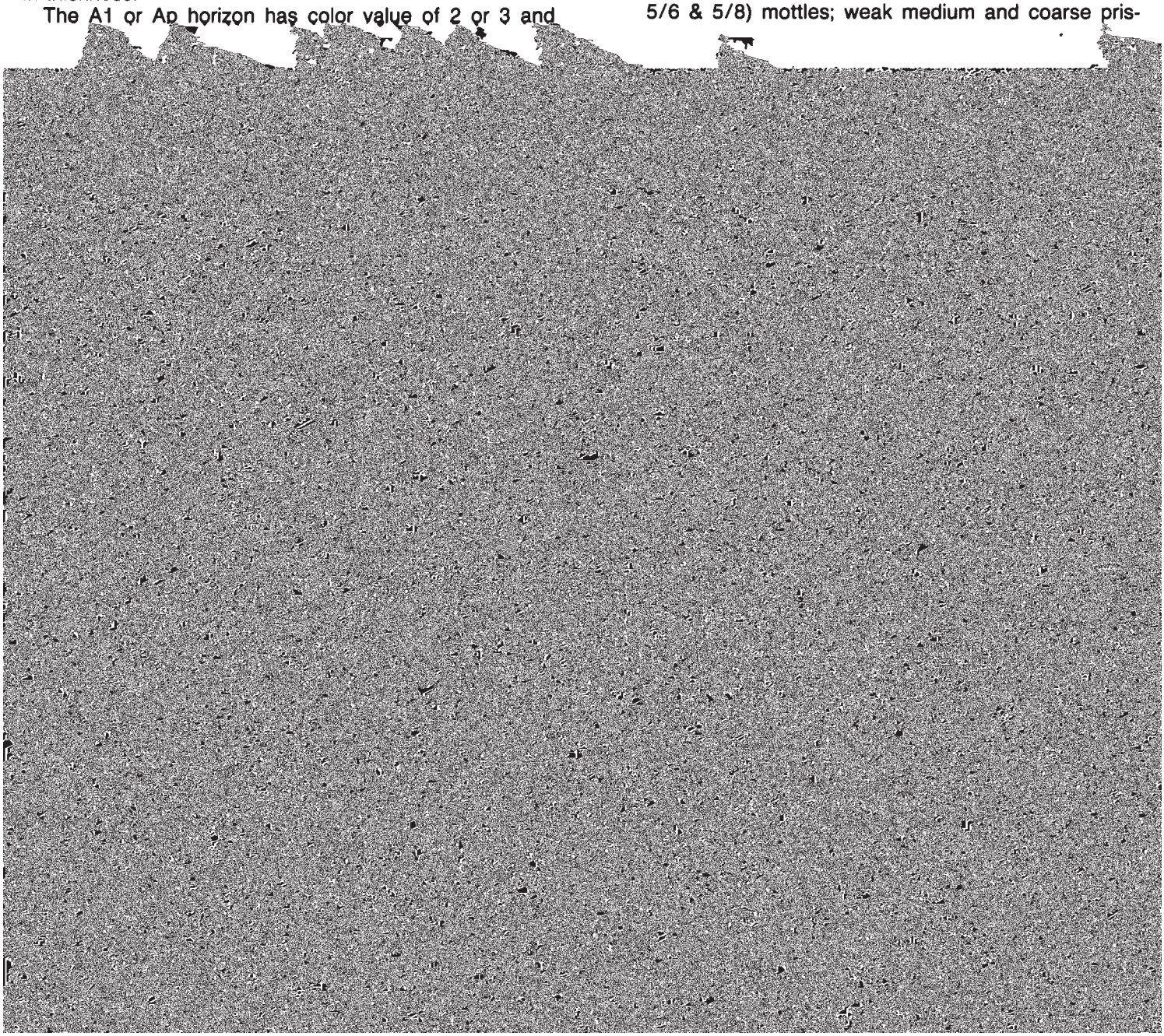
The solum ranges from 42 inches to about 70 inches in thickness.

The A1 or Ap horizon has color value of 2 or 3 and

7/1) uncoated silt grains on faces of peds; strongly acid; clear smooth boundary.

B22t—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common roots; thin discontinuous dark brown (10YR 4/3) clay films and light gray (10YR 7/1) uncoated silt grains on faces of peds; few fine dark accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

B23t—24 to 31 inches; dark brown (10YR 4/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6 & 5/8) mottles; weak medium and coarse pris-



Boone series

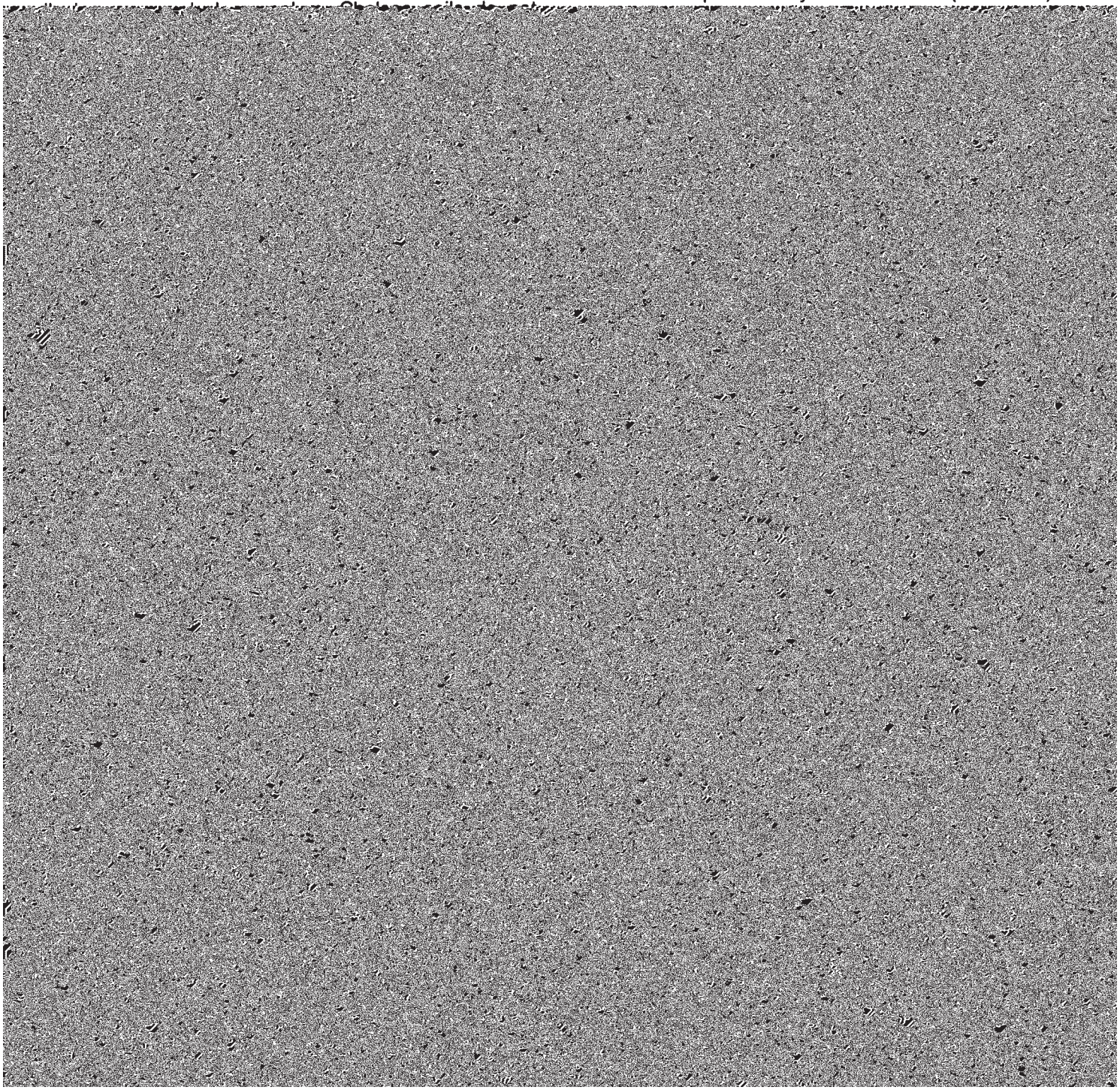
This series consists of excessively drained soils that have rapid permeability. These soils formed in fine, medium, or coarse sand residuum weathered from sandstone bedrock. They formed under forest vegetation on ridgetops and valley slopes. Slope ranges from 2 to 45 percent.

Boone soils are near Chelsea and Eleva soils. Eleva

granular structure; friable; few roots; layer compacted because of tillage; strong effervescence; moderately alkaline; abrupt smooth boundary.

A†2—7 to 19 inches; very dark gray (10YR 3/1) clay loam, gray (10YR 5/1) dry; weak fine granular structure; friable; few roots; strong effervescence; moderately alkaline; clear smooth boundary.

B1g—19 to 26 inches; olive gray (5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mot-



mollic surface layer. Ogle soils have a buried soil that has hue of 5YR at a depth of more than 30 inches. Sidell soils contain more sand in the lower part of the 40-inch control section, and the silty mantle is commonly less than 40 inches thick.

Typical pedon from an area of Catlin silt loam, 0 to 2 percent slopes, on a loess covered glacial till plain about 1 1/2 miles south and 2 1/2 miles east of Monroe Center, 571 feet east and 650 feet south of northwest corner of sec. 36, T. 42 N., R. 2 E.

Ap—0 to 11 inches; very dark brown (10YR 2/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine and fine granular structure; friable; many roots; layer compacted because of tillage; neutral; abrupt smooth boundary.

B1t—11 to 18 inches; dark brown (10YR 4/3) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common roots; thin discontinuous dark brown (10YR 3/3) clay films and patchy light gray (10YR 7/1) uncoated silt grains on faces of peds; medium acid; clear smooth boundary.

B21t—18 to 23 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to strong fine and medium subangular blocky; friable; common roots; moderate continuous dark brown (10YR 4/3 & 3/3) clay films and patchy light gray (10YR 7/1) uncoated silt grains on faces of peds; medium acid; clear smooth boundary.

B22t—23 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; few fine prominent dark brown (7.5YR [illegible] nese oxides); few very dark brown (10YR 2/2) root channel linings; slightly acid; abrupt smooth boundary.

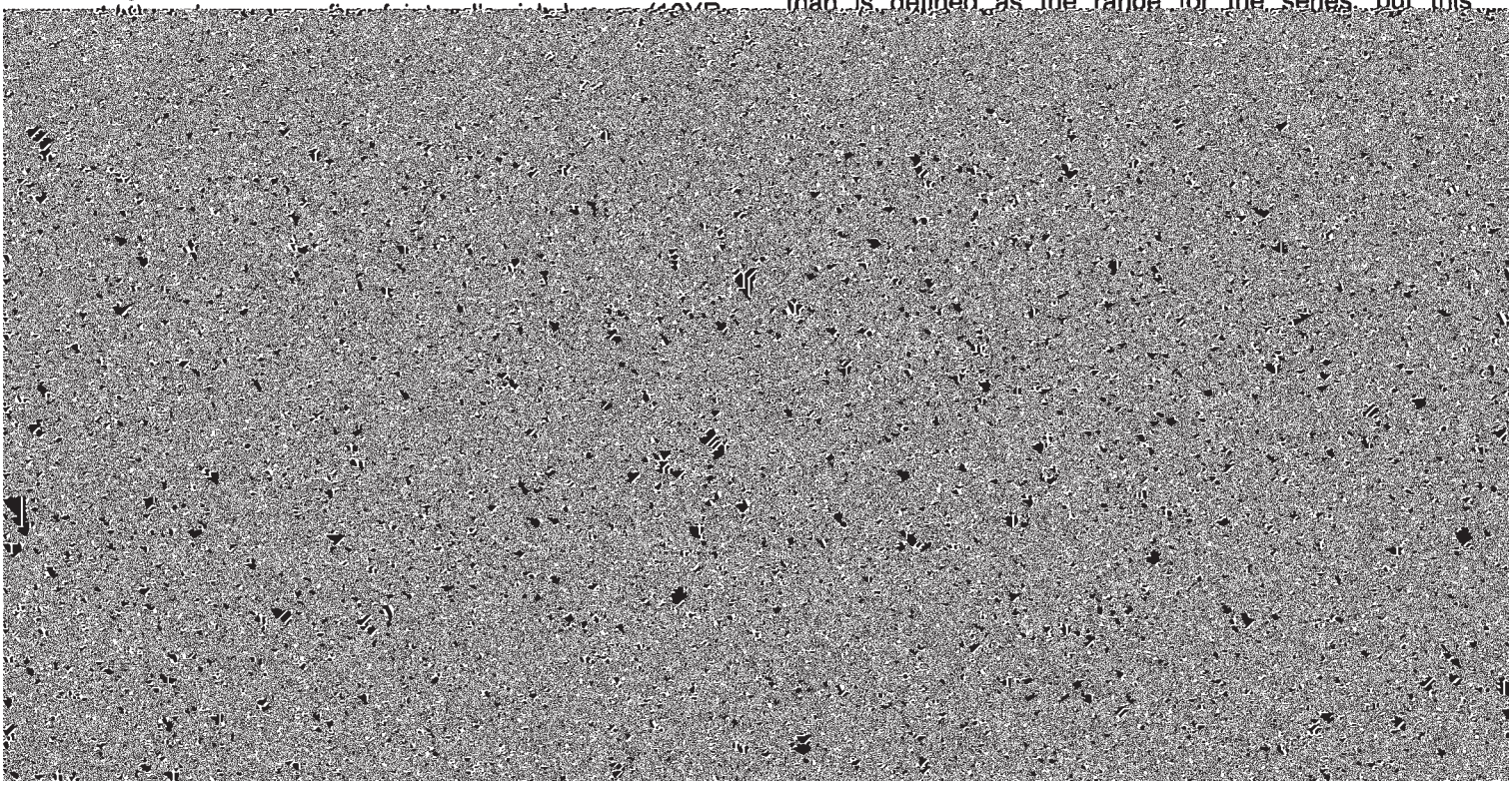
IIB3t—44 to 49 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse subangular blocky structure; firm; few roots; thick discontinuous very dark brown (10YR 2/2) and brown (10YR 5/3) clay films on vertical faces of peds; few very dark brown (10YR 2/2) root channel linings; neutral; clear smooth boundary.

IIC—49 to 60 inches; yellowish brown (10YR 5/4) loam; common fine faint yellowish brown (10YR 5/6) mottles; massive; firm; few roots; few very dark brown (10YR 2/2) root channel linings; strong effervescence; moderately alkaline.

The solum is typically 45 to 55 inches thick, but in some pedons it is 65 inches thick or more. It commonly extends 4 to 12 inches into the glacial till or lakebed sediment. Reaction generally is medium acid in the upper part of the solum and grades to neutral in the lower part. In some pedons, the soil is slightly acid or neutral throughout.

The A horizon has color value of 2 or 3 and chroma of 1 through 3. The B horizon generally has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 through 6, except that in some pedons the lower part has hue of 7.5YR and is mottled. The IIB horizon is silt loam, loam, clay loam, or light silty clay loam that is high in content of sand. It formed in till or lacustrine deposit. The IIC horizon is loam, silt loam, clay loam, or silty clay loam.

In mapping unit 171C2, the surface layer is thinner than is defined as the range for the series, but this



medium subangular blocky structure parting to moderate very fine granular; very friable; common roots; thin discontinuous dark brown (10YR 3/3) clay and organic films on faces of peds; medium acid; clear smooth boundary.

A22—6 to 11 inches; yellowish brown (10YR 5/4) sand; very weak medium and coarse subangular blocky structure parting to single grained; loose; common roots; medium acid; clear smooth boundary.

A23—11 to 22 inches; yellowish brown (10YR 5/4) sand; very weak medium and coarse subangular blocky structure parting to single grained; loose; few roots; medium acid; clear smooth boundary.

A24—22 to 32 inches; yellowish brown (10YR 5/4) sand; very weak coarse prismatic structure parting to single grained; loose; medium acid; gradual smooth boundary.

A25—32 to 38 inches; yellowish brown (10YR 5/6) sand; very weak coarse prismatic structure parting to single grained; loose; few very fine bands of brown (7.5YR 4/4) sand grains; medium acid; gradual smooth boundary.

A&B—38 to 60 inches; brownish yellow (10YR 6/6) sand (A2); single grained; loose; some brown (7.5YR 4/4) and strong brown (7.5YR 5/6) thin bands of loamy sand (B2t); 6 percent pebbles in lower part; medium acid.

The solum ranges from 4 feet to many feet in thickness.

The A1 or Ap horizon ranges in color value from 2 through 4 and in chroma from 1 through 3. The upper part of the A2 horizon has color value of 5 or 4 and chroma of 2 through 4, and the lower part has color value of 4 through 6 and chroma or 4 through 6. In the

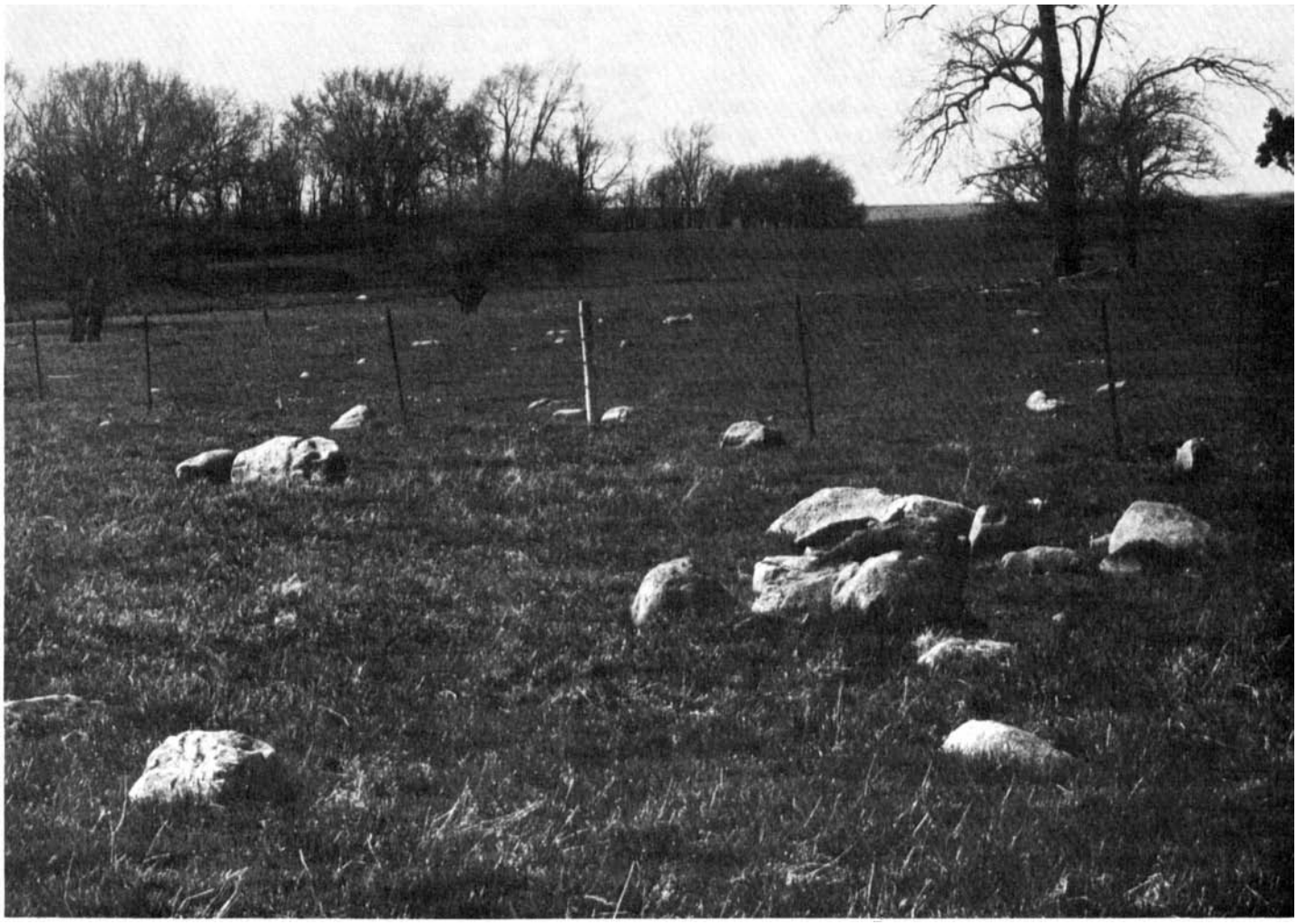


Figure 10.—Boulder strewn field of Comfrey clay loam.

A&B horizon, the B part is lamellae 1/2 to 2 inches thick that have hue of 7.5YR or 10YR, value and chroma commonly of 3 or 4, and texture of light sandy loam or loamy sand. The depth to the uppermost bands commonly is 36 inches and ranges from 27 to 48 inches.

Comfrey series

This series consists of poorly drained soils that have moderate permeability. These soils formed in alluvial sediment under prairie vegetation and trees on outwash plains and river bottoms (fig. 10). Slope ranges from 0 to 3 percent. The depth to free carbonates is deeper than is defined as the range for the series, but this difference does not alter the use or behavior of the soil.

Comfrey soils are similar to Sawmill soils and are near Drummer, Lawson, Millington, and Selma soils. Sawmill soils have less sand in the solum. Drummer and Selma soils do not have a cumulic surface layer. Millington soils are calcareous throughout the solum. Lawson soils have better natural drainage.

Typical pedon from an area of Comfrey clay loam on the Rock River flood plain, about 1 mile east of Byron, 1,815 feet north and 990 feet east of southwest corner of sec. 33, T. 23 N., R. 11 E.

Ap—0 to 7 inches; black (10YR 2/1) clay loam, dark gray (10YR 4/1) dry; moderate very fine and fine granular structure; friable; few roots; layer compacted because of tillage; neutral; abrupt smooth boundary.

A12—7 to 13 inches; black (10YR 2/1) clay loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; friable; few roots; mildly alkaline; clear smooth boundary.

A13—13 to 27 inches; black (10YR 2/1) clay loam; dark gray (10YR 4/1) dry; moderate very fine and fine subangular blocky structure; friable; few roots; mildly alkaline; clear smooth boundary.

A14—27 to 35 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; few fine faint yellowish brown (10YR 5/6) mottles; weak medium prismatic structure part-

The A horizon ranges from 24 to 36 inches in thickness. The depth to free carbonates is more than 48 inches in most pedons.

The A horizon typically has hue of 10YR or is neutral, and it has chroma of 1 or less. It typically is clay loam or loam, but subhorizons in some pedons are silty clay loam or silt loam that is high in content of sand. The C horizon is typically loam or clay loam, but it ranges from silt loam or silty clay loam that is high in content of sand to stratified loam, sandy loam, loamy sand, and sand.

Dickinson series

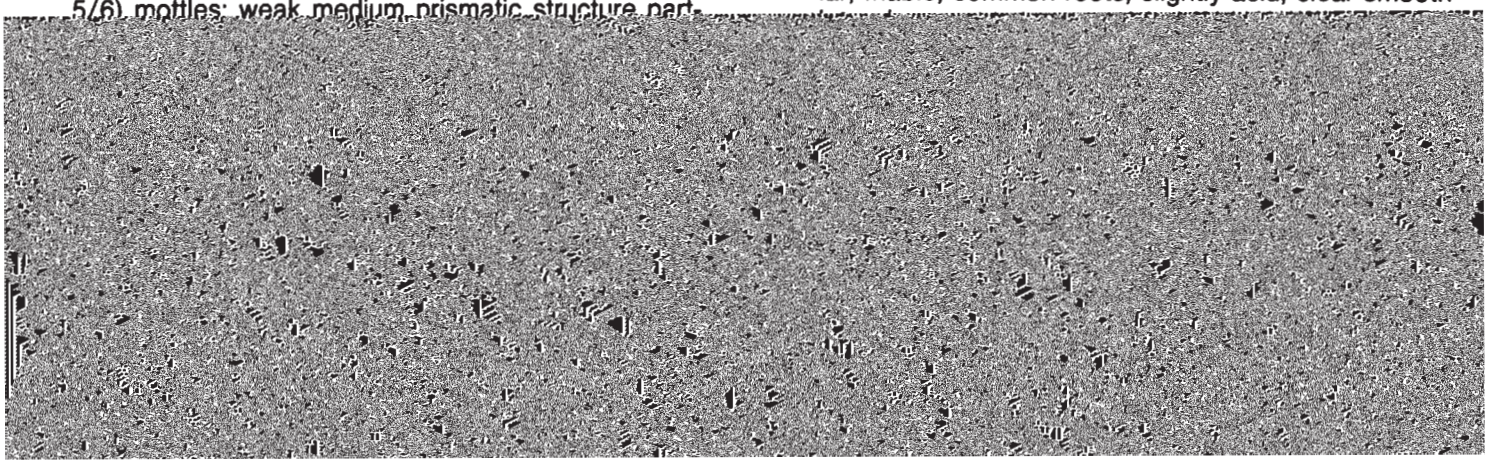
This series consists of well drained soils that have moderately rapid permeability in the upper part of the solum and rapid permeability in the lower part. These soils formed in moderately coarse textured glacial drift or outwash and alluvial sediment reworked by wind. They formed under prairie vegetation on uplands and terraces. Slope ranges from 1 to 12 percent.

Dickinson soils are similar to Lamont soils and are near the Jasper, La Hogue, Sparta, and Warsaw soils. Lamont soils do not have a mollic surface layer. Jasper and Warsaw soils have more clay in the solum. In addition, Warsaw soils are over sand and gravel. La Hogue soils are somewhat poorly drained. Sparta soils are coarser textured.

Typical pedon from an area of Dickinson sandy loam, 1 to 5 percent slopes, on an outwash terrace about 1 1/2 miles north and 1/2 miles east of Byron along Illinois Route 2, 1,875 feet east and 490 feet south of center of sec. 20, T. 25 N., R. 11 E.

A1—0 to 8 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common roots; layer compacted because of tillage; strongly acid; clear smooth boundary.

A3—8 to 12 inches; mixed very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) sandy loam, brown (10YR 5/3) dry; weak fine and medium subangular blocky structure parting to weak fine granular; friable; common roots; slightly acid; clear smooth



subangular blocky structure; very friable; few roots; thin discontinuous dark brown (10YR 3/3) clay and organic films on faces of peds; few pebbles in lower part; slightly acid; clear smooth boundary.

C11—46 to 54 inches; yellowish brown (10YR 5/6) sand; single grained; loose; few pebbles; few faint bands; slightly acid; clear smooth boundary.

C12—54 to 60 inches; mixed yellowish brown (10YR 5/4 and 5/6) sand; single grained; loose; dark yellowish brown (10YR 3/4) bands; few pebbles; strongly acid.

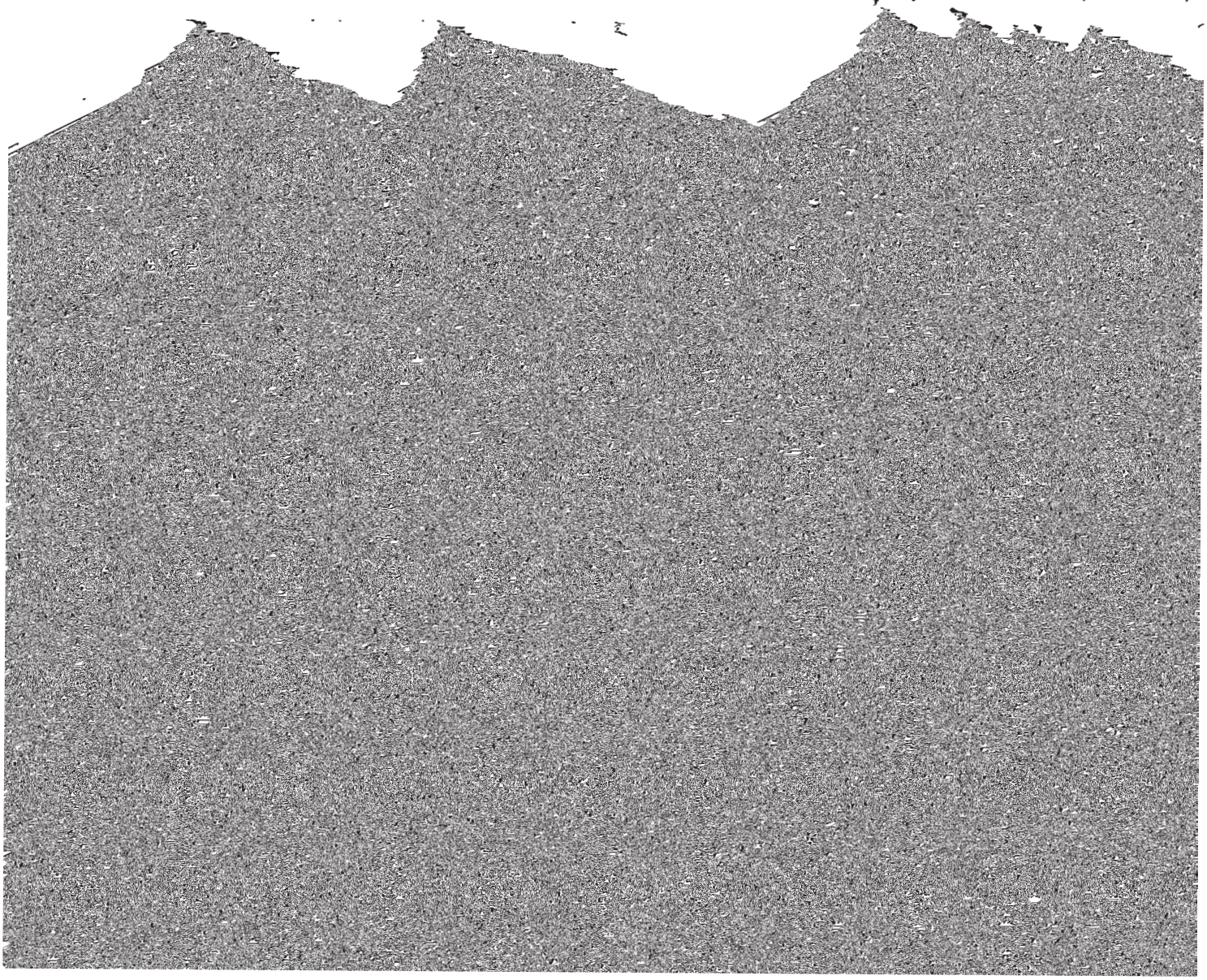
The solum ranges from 24 to 50 inches in thickness. Loamy sand and sand are typically between depths of 20 and 36 inches, but they range to a depth of as much as 42 inches.

The A horizon has color value of 2 or 3 and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loam. The parting to strong fine subangular blocky; firm; common roots; thin discontinuous dark brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—25 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure; firm; few roots; thin discontinuous dark brown (10YR 4/3) clay films on faces of peds; few sand grains; medium acid; clear smooth boundary.

IIB3—29 to 33 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse prismatic structure; friable; few roots; thin discontinuous very dark grayish brown (10YR 3/2) clay films on faces of peds; some pebbles; few fine dark accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

IIC—33 to 60 inches; light yellowish brown (10YR 6/4)



B1—7 to 12 inches; dark brown (10YR 4/3) mixed with some very dark gray (10YR 3/1) silty clay loam; weak fine and medium subangular blocky structure; friable; common roots; medium acid; clear smooth boundary.

B21t—12 to 17 inches; dark brown (10YR 4/3) mixed with some very dark gray (10YR 3/1) silty clay loam; moderate medium subangular blocky structure parting to moderate very fine and fine subangular blocky; friable; few roots; medium acid; clear smooth boundary.

B22t—17 to 24 inches; dark brown (10YR 4/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few roots; thin discontinuous very dark grayish brown (10YR 3/2) and thin patchy very dark gray (10YR 3/1) clay films on faces of peds; medium acid; clear smooth boundary.

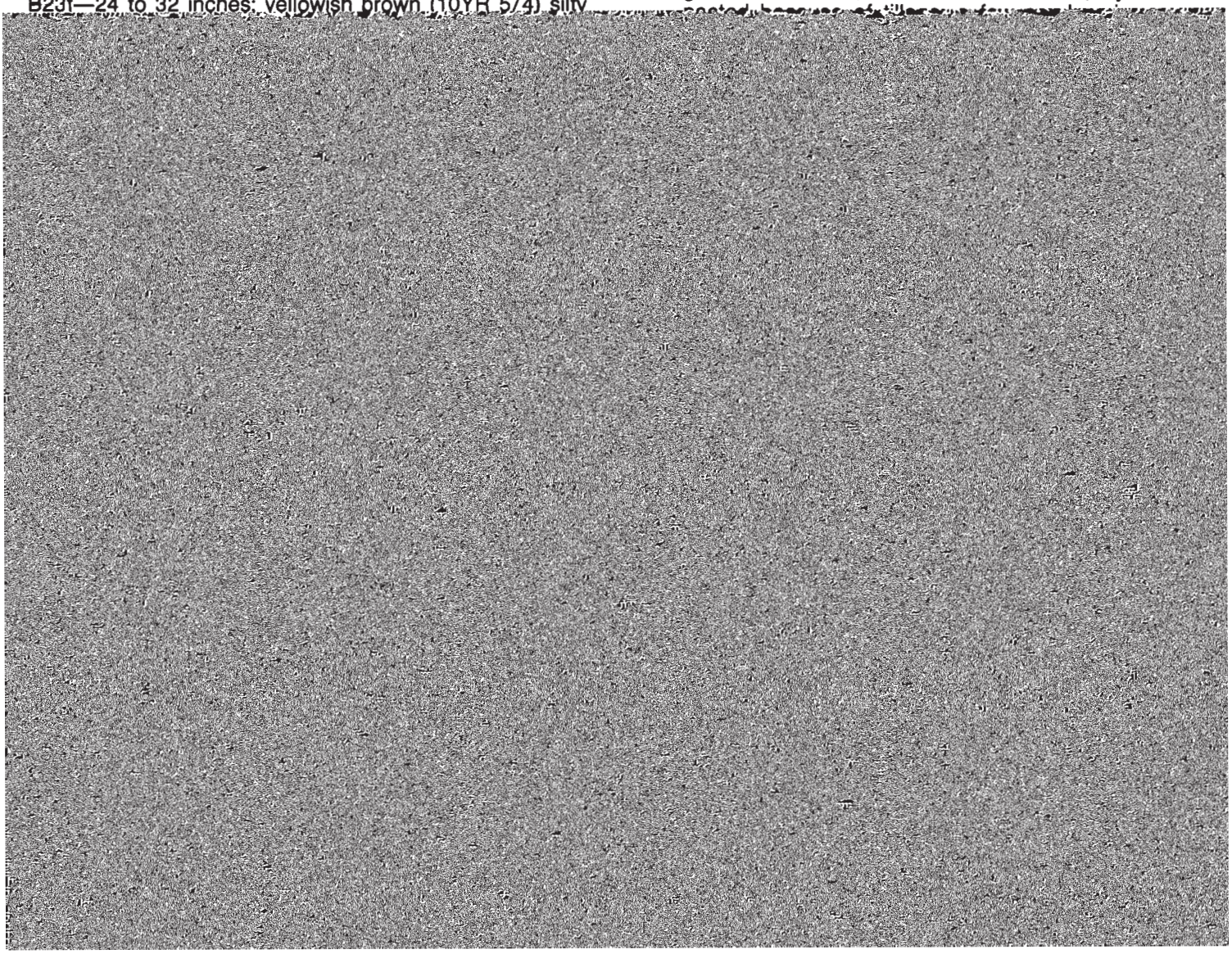
B23t—24 to 32 inches; yellowish brown (10YR 5/4) silty

stratified outwash and glacial till. They formed under marsh grass and sedge vegetation. Slope ranges from 0 to 3 percent.

Drummer soils are similar to Sable and Selma soils and are near Elburn, Canisteo, and Sawmill soils. Sable soils have less sand in the lower part of the B horizon and in the C horizon. Selma soils have more sand in the upper part of the solum. Canisteo soils have a calcareous solum. Elburn soils have better natural drainage. Sawmill soils have a mollic surface layer that is more than 24 inches thick.

Typical pedon from an area of Drummer silty clay loam on an outwash plain about 1 1/2 miles south and 2 1/2 miles east of Lindenwood, 2,605 feet west and 65 feet south of northeast corner of sec. 14, T. 41 N., R. 2 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common roots; layer com-



The solum is commonly 44 to 50 inches thick, but in some pedons, it is as much as 60 inches thick or more.

The A horizon has color value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of mainly 5Y or 2.5Y and less commonly 10YR, value of 4 or more, and chroma of 2 or less. Mottles are of higher value and chroma. The Bg horizon typically is silty clay loam in the upper part and grades to silt loam, loam, or clay loam in the lower part. The C horizon is commonly stratified silt loam, loam, sandy loam, clay loam, silty clay loam, and a few gravelly loam layers.

Dubuque series

This series consists of moderately deep, well drained soils that have moderate permeability in the upper part of the solum and slow permeability in the lower part. These soils formed in 18 to 36 inches of loess and a thin layer of residual material weathered from limestone or dolomite bedrock. They formed under forest vegetation on uplands. Slope ranges from 7 to 15 percent.

Dubuque soils are near Fayette, Miami, Palsgrove,

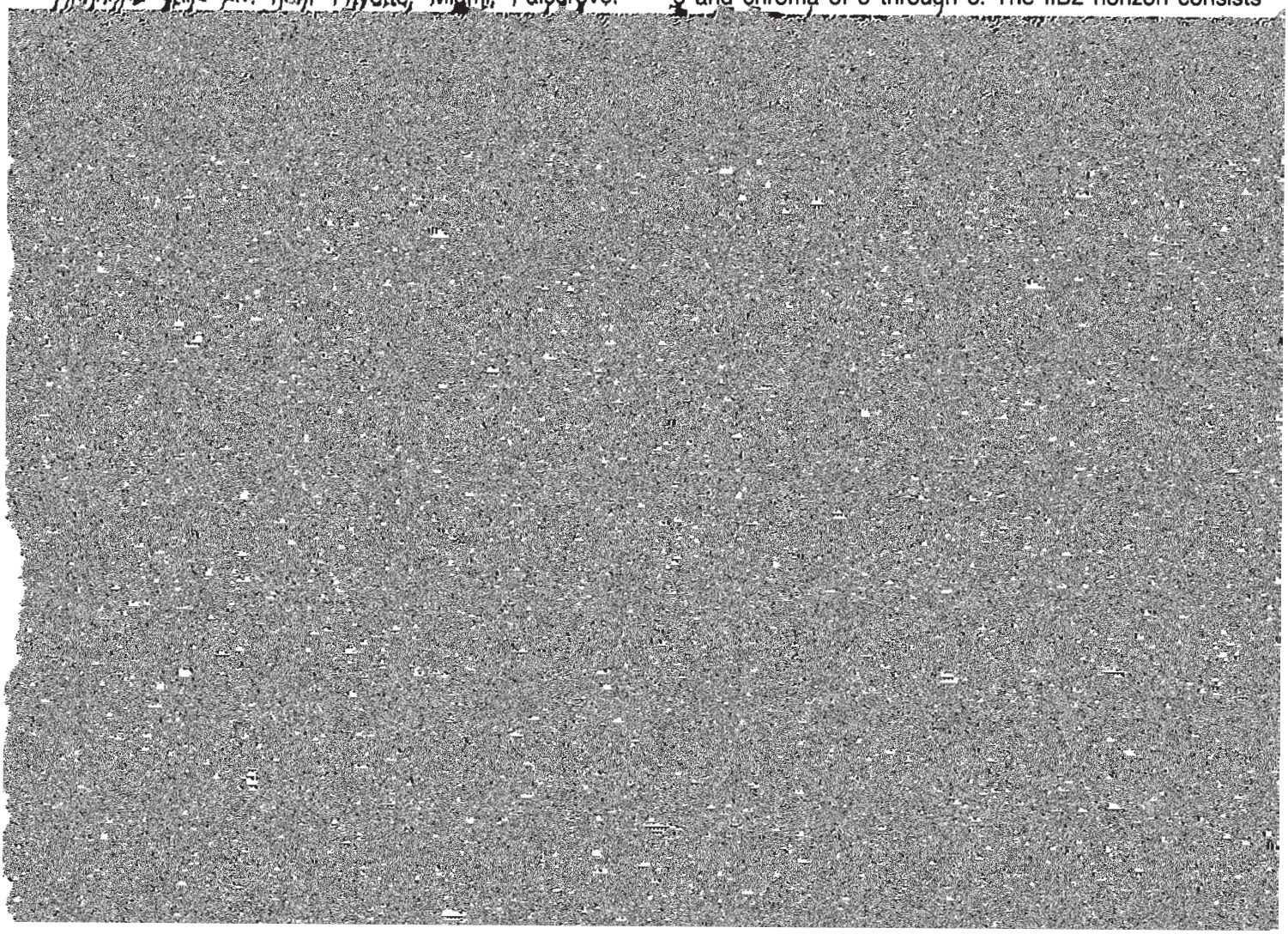
firm; few roots; thin discontinuous dark reddish brown (5YR 3/4) clay films on faces of peds; common fine dark concretions (iron and manganese oxides); stone line at top of horizon; medium acid; clear smooth boundary.

IIB24t—27 to 32 inches; reddish brown (5YR 4/4) clay; weak coarse prismatic structure; firm; few roots; thick continuous dark brown (7.5YR 4/4) clay films on faces of peds; medium acid; abrupt smooth boundary.

IIR—32 to 35 inches; very pale brown (10YR 7/3) fragmented dolomite over hard bedded dolomite; some dolomitic fragments are easily separated and have small amounts of reddish clayey material between them; strong effervescence; moderately alkaline.

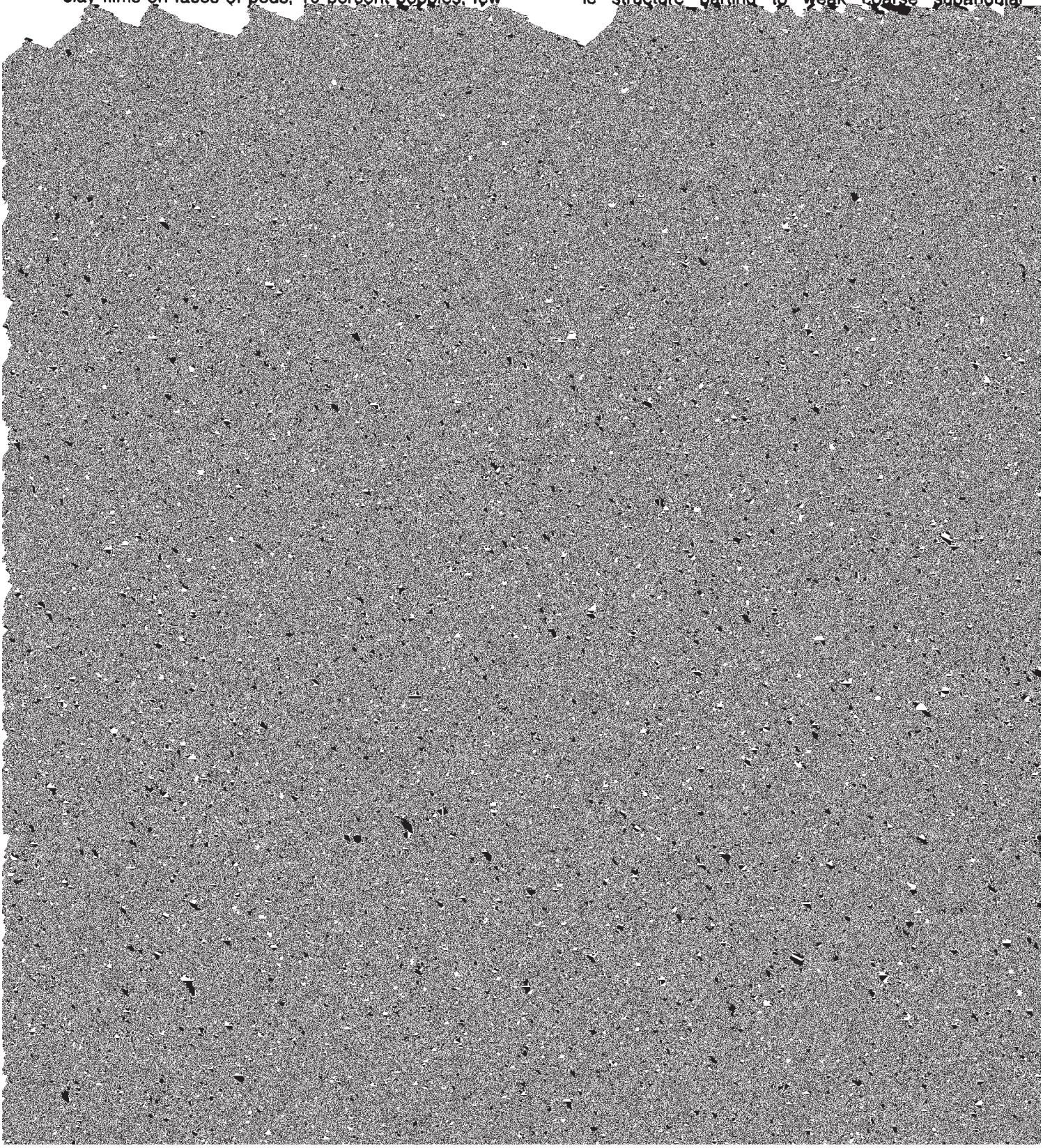
The thickness of the solum and depth to limestone bedrock range from 20 to 40 inches.

The Ap horizon has color value of 4 or 5 and chroma of 2 or 3. The B2t horizon is silt loam or silty clay loam. The upper part of the B2t horizon has color value of 4 or 5 and chroma of 3 through 6. The IIB2 horizon consists



firm; common roots; thin patchy brown (10YR 4/3) clay films on faces of peds; 10 percent pebbles; few

grayish brown (10YR 5/2) dry; weak coarse prismatic structure parting to weak coarse subangular



dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

IIB22t—20 to 26 inches; dark brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; friable; few roots; thin discontinuous dark brown (10YR 3/3) clay films on faces of peds; some pebbles; strongly acid; clear smooth boundary.

IIB23t—26 to 32 inches; dark brown (7.5YR 4/4) loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few roots; thin discontinuous dark reddish brown (5YR 3/4) clay films on faces of peds; medium acid; clear smooth boundary.

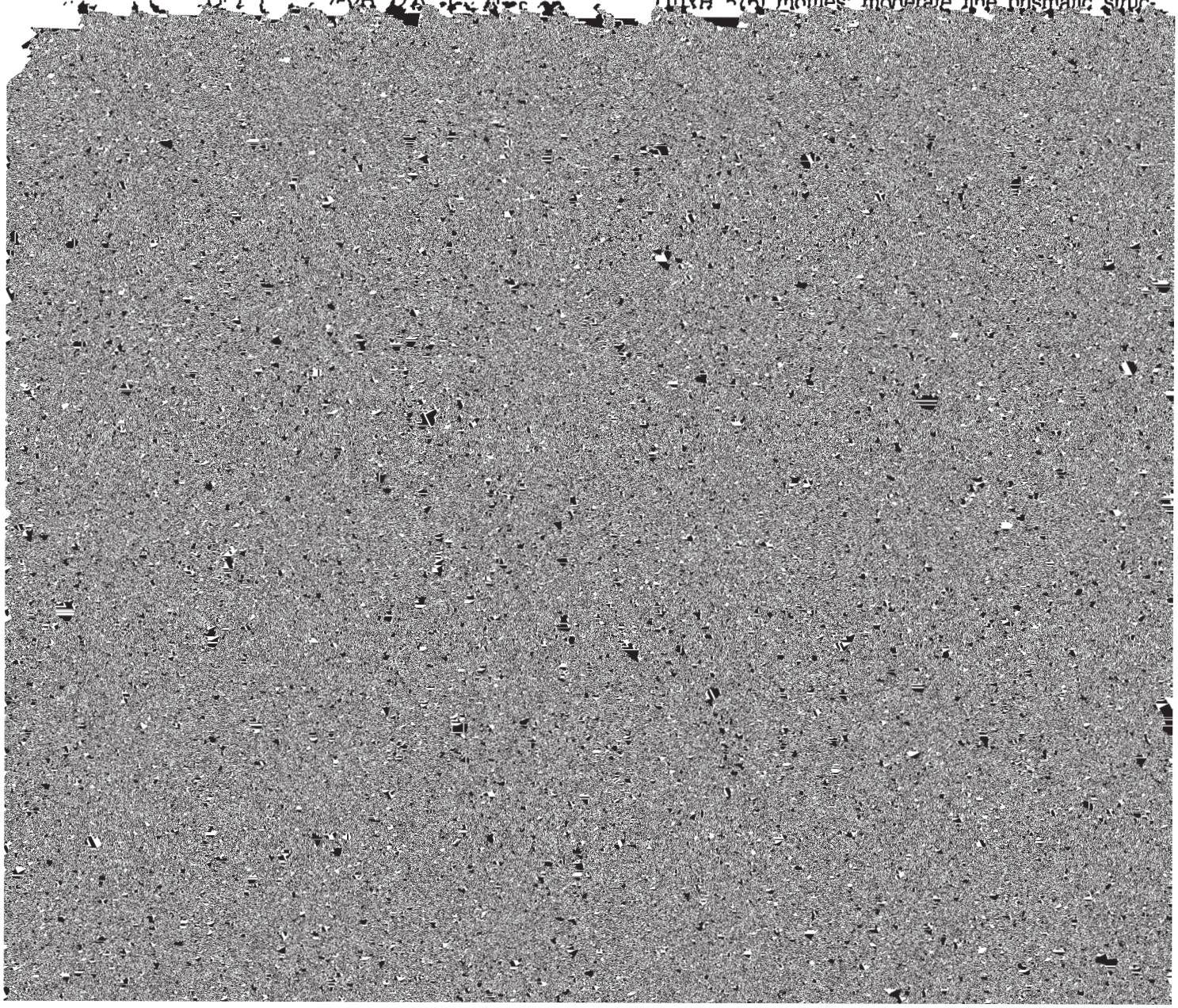
IIB24t—32 to 60 inches; yellowish red (7.5YR 4/4) loam; weak coarse prismatic structure; friable; few roots;

granular structure; friable; common roots; high pH may be caused by road dust; mildly alkaline; clear smooth boundary.

A12—13 to 17 inches; very dark gray (10YR 3/1) silt loam; gray (10YR 5/1) dry; moderate medium and coarse granular structure; friable; common roots; neutral; clear smooth boundary.

A3—17 to 21 inches; mixed very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) silt loam, gray (10YR 5/1) and light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure parting to moderate medium and coarse granular; friable; common roots; slightly acid; clear smooth boundary.

B21t—21 to 26 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine prismatic struc-



2.5Y, value of 4 or 5, and chroma of 2 through 4. The IIB horizon is silt loam, loam, sandy loam, or clay loam. The IIC horizon is stratified loamy outwash or, in some pedons, calcareous sandy loam till.

Elco series

This series consists of moderately well drained soils that have moderate permeability in the upper part of the solum and moderately slow permeability in the lower part. These soils formed in 20 to 40 inches of loess or other silty material and in the underlying glacial drift. They formed under forest vegetation. Slope ranges from 5 to 10 percent.

Elco soils are similar to and are near Fayette, Flagg, Rozetta, and St. Charles soils. Fayette, Rozetta, and St. Charles soils formed in thicker loess deposit and do not have a buried soil. Flagg soils have a B horizon that is redder in hue.

Typical pedon from an area of Elco silt loam, 5 to 10 percent slopes, eroded, on a convex side slope about 4 miles north and 1 1/2 miles east of Byron, 1,416 feet west and 255 feet north of southeast corner of sec. 4, T. 25 N., R. 11 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) mixed with some dark brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate very fine and fine granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

A2—8 to 12 inches; yellowish brown (10YR 5/4) silt loam; weak thin and medium platy structure parting to moderate very fine and fine granular; friable; common roots; few light gray (10YR 7/1) uncoated silt grains on faces of peds; few fine dark accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

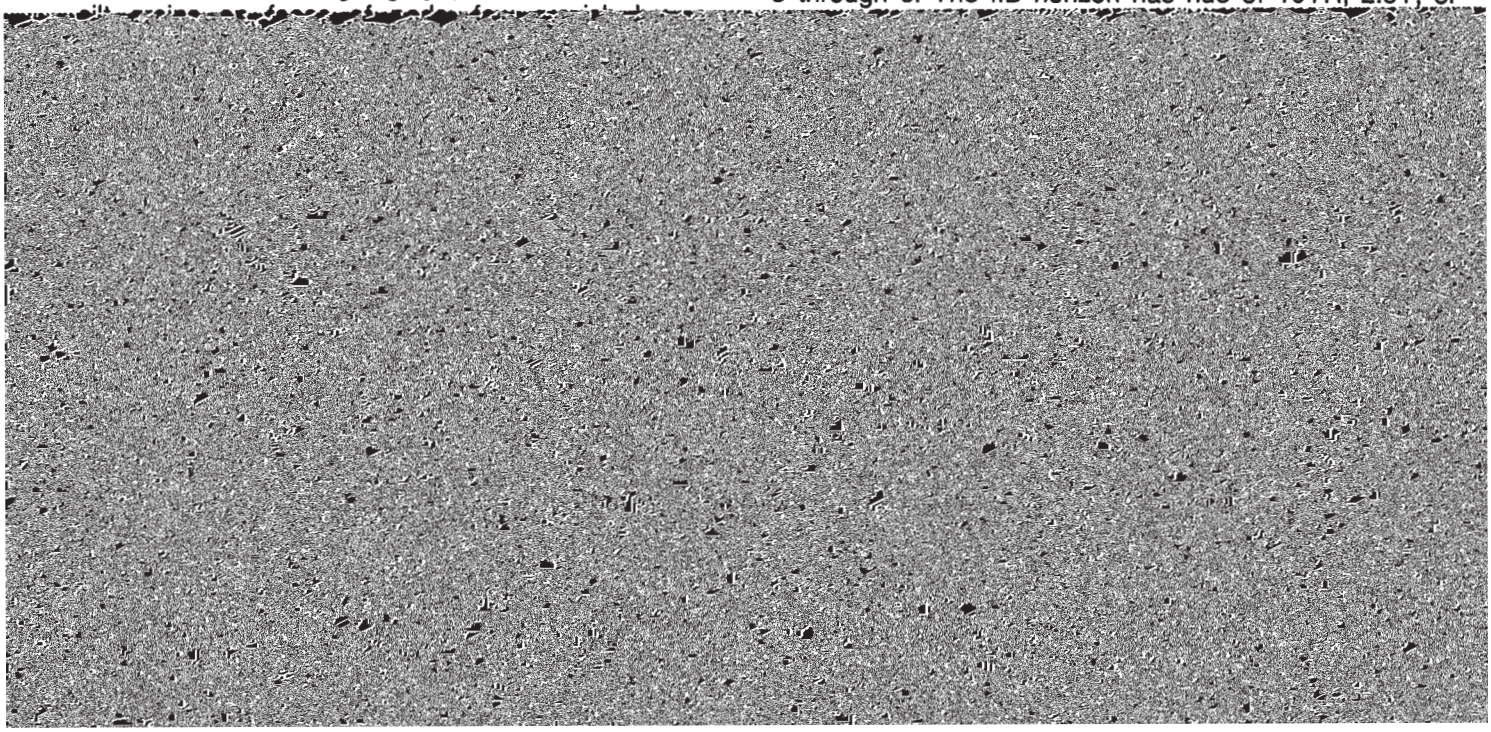
IIB23tb—31 to 38 inches; very dark gray (10YR 3/1) clay loam; moderate coarse prismatic structure; friable; few roots; thick continuous very dark grayish brown (10YR 3/2) clay films and light gray (10YR 7/1) uncoated silt grains on faces of peds; some glacial pebbles present; few fine dark accumulations (iron and manganese oxides); strongly acid; abrupt smooth boundary.

IIB24tb—38 to 49 inches; dark grayish brown (2.5Y 4/2) loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; few roots; thin discontinuous very dark grayish brown (10YR 3/2) clay films on faces of peds; some glacial pebbles present; some sand grains on faces of peds; strongly acid; gradual smooth boundary.

IIB3b—49 to 67 inches; mixed dark grayish brown (2.5Y 4/2), olive brown (2.5Y 4/4), and grayish brown (2.5Y 5/2) loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; some glacial pebbles; medium acid.

The solum ranges from 4 feet to more than 7 feet in thickness. The thickness of the silty material and the depth to the buried soil ranges from 20 to 40 inches.

Most pedons have an Ap horizon that includes the A1 horizon and most of the A2 horizon. Where present, the A1 horizon is less than 5 inches thick. The A2 horizon has color value of 4 or 5 and chroma of 2 through 4. The B2 horizon has color value of 4 or 5 and chroma of 3 through 6. The IIB horizon has hue of 10YR, 2.5Y, or



6/1) dry; moderate very fine and fine granular structure; friable; many roots; 1 inch of leaf litter on surface; neutral; clear smooth boundary.

A2—3 to 7 inches; yellowish brown (10YR 5/4) sandy loam; weak fine and medium subangular blocky structure; friable; common roots; neutral; clear smooth boundary.

B21t—7 to 13 inches; yellowish brown (10YR 5/6) sandy loam; weak fine and medium subangular blocky structure; friable; common roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—13 to 21 inches; yellowish brown (10YR 5/6) sandy loam; moderate fine and medium subangular blocky structure; friable; common roots; thin discontinuous yellowish brown (10YR 5/4) clay films on faces of peds; few pebbles; strongly acid; clear smooth boundary.

B3t—21 to 28 inches; thin stratified yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) loamy sand; weak medium subangular blocky structure; very friable; few roots; thin patchy dark yellowish brown (10YR 4/4) clay films on faces of peds; many small chunks of sandstone rock; strongly acid; gradual smooth boundary.

C—28 to 35 inches; brownish yellow (10YR 6/6) and some yellowish brown (10YR 5/6) sand; single grained; loose; few roots; weakly cemented sandstone; strongly acid; gradual smooth boundary.

R—35 inches; mixed yellow (10YR 7/6) and very pale brown (10YR 7/4) hard sandstone.

The solum ranges from 20 to 40 inches in thickness. Strongly cemented sandstone typically is at a depth ranging from 30 to 60 inches. The solum ranges from slightly acid to strongly acid, but in some pedons, it is very strongly acid.

The A horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 1 through 3. The B2t horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. It is sandy loam or loam. Some pedons do not have a B3 horizon.

Fayette series

The Fayette series consists of well drained soils that have moderate permeability. These soils formed in deep loess under forest vegetation on uplands. Slope ranges from 2 to 15 percent.

Fayette soils are similar to and are near Downs, Flagg, Palsgrove, Rozetta, and St. Charles soils. Downs soils have a thicker and darker A1 horizon and a less distinct A2 horizon. Flagg soils are underlain by glacial till within 60 inches of the surface. Palsgrove soils have more clay in the lower part of the solum and are underlain by limestone and dolomite bedrock. Rozetta soils contain

Typical pedon from an area of Fayette silt loam, 2 to 5 percent slopes (fig. 11), on a loess covered upland about 5 miles north and 1 mile east of Grand Detour, 3,505 feet south and 489 feet east of the northwest corner of sec. 19, T. 23 N., R. 10 E.

Figure 11.—Roadcut showing the horizon sequence of Fayette silt loam, 2 to 5 percent slopes.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate

A2—7 to 11 inches; yellowish brown (10YR 5/4) silt loam; weak thin platy structure parting to moderate fine granular; friable; common roots; light gray (10YR 7/1) dry uncoated silt grains on faces of peds; medium acid; clear smooth boundary.

B21t—11 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few roots; thin continuous dark brown (10YR 4/3) clay films and light gray (10YR 7/1) dry uncoated silt grains on faces of peds; strongly acid; clear smooth boundary.

B22t—19 to 28 inches; mixed dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; friable; few roots; thin continuous dark brown (10YR 4/3) clay films and light gray (10YR 7/1) dry uncoated silt grains on faces of peds; few fine dark accumulations (iron and manganese oxides) in lower half of horizon; strongly acid; clear smooth boundary.

B23t—28 to 44 inches; mixed dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; friable; few roots; thin continuous dark brown (10YR 4/3) clay films and light gray (10YR 7/1) dry uncoated silt grains on faces of peds; few fine dark accumulations (iron and manganese oxides);

Flagg series

This series consists of well drained soils that have moderate permeability. These soils formed in 30 to 50 inches of loess over reddish glacial till. They formed under forest vegetation on till plains and moraines. Slope ranges from 2 to 10 percent.

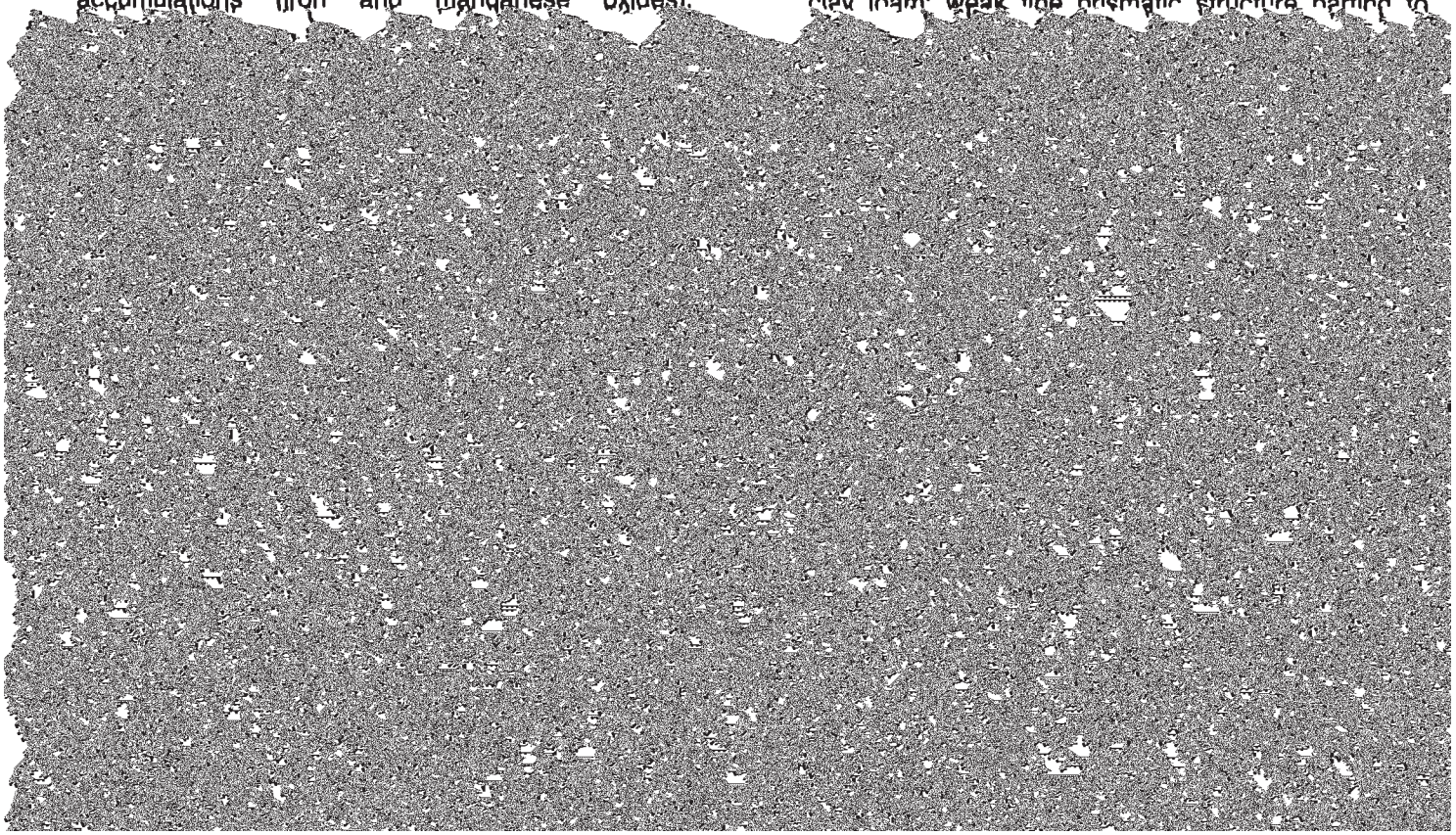
Flagg soils are similar to and are near Fayette, Palsgrove, Pecatonica, and St. Charles soils. Fayette and St. Charles soils do not have a IIB horizon that has a hue of 5YR or redder. Palsgrove soils have more clay in the lower part of the B horizon and their solum is terminated by bedrock. Pecatonica soils have less than 30 inches of loess and more sand in the solum.

Typical pedon from an area of Flagg silt loam, 2 to 5 percent slopes, on an upland till plain about 6 miles northeast of Byron, 960 feet east and 956 feet south of northwest corner of sec. 2, T. 25 N., R. 11 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate very fine and fine granular structure; friable; many roots; strongly acid; abrupt smooth boundary.

A2—6 to 10 inches; yellowish brown (10YR 5/4) silt loam; weak thin platy structure parting to moderate fine granular; friable; common roots; light gray (10YR 7/1) uncoated silt grains on faces of peds; strongly acid; clear smooth boundary.

B1t—10 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine prismatic structure parting to



ture; friable; few roots; thin continuous reddish brown (5YR 4/4) clay films and very pale brown (10YR 7/3) uncoated sand grains on faces of peds; 3 percent pebbles; strongly acid; gradual smooth boundary.

IIB25t—47 to 60 inches; yellowish red (5YR 4/6) sandy clay loam; moderate coarse prismatic structure; friable; few roots; moderate discontinuous reddish brown (5YR 4/4) clay films and very pale brown (10YR 7/3) uncoated sand grains on faces of peds; 3 percent pebbles; strongly acid.

The solum commonly is 5 feet or more thick. It typically is medium acid to very strongly acid.

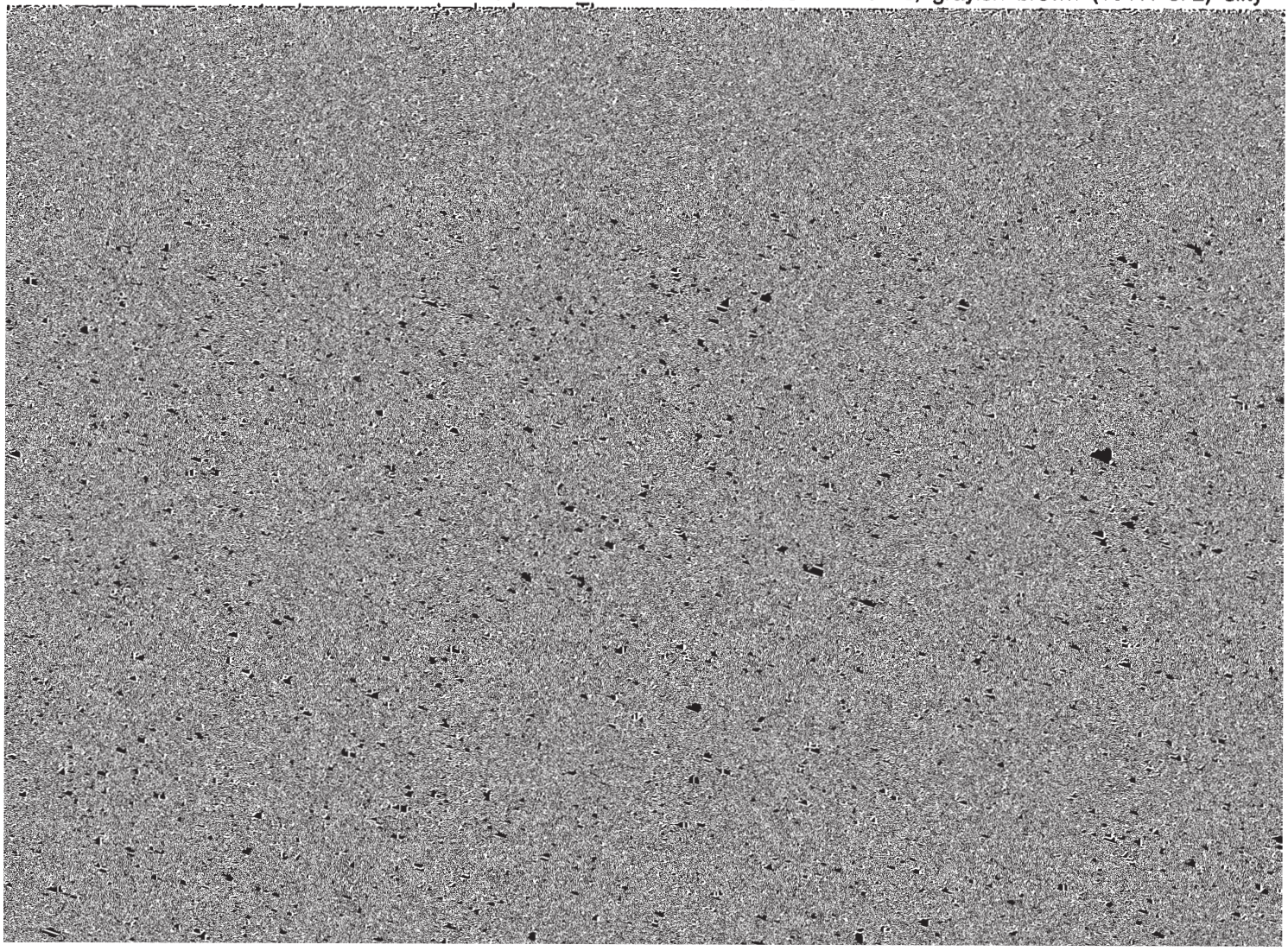
The Ap horizon has color value of 4 or 5 and chroma of 2 or 3. The B2t horizon that formed in loess has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3, 4, or 5. The IIB horizon has hue of 2.5YR, 5YR, 7.5YR, or 10YR; value of 4, 5, or 6; and chroma of 4, 5, or 6. Hue of 5YR or redder is in the matrix in at least one subhorizon in the IIBt horizon. The IIB horizon is silty clay loam

blocky structure; friable; common roots; thin continuous very dark grayish brown (10YR 3/2) clay films on faces of peds; few black (10YR 2/1) root channels; medium acid; clear smooth boundary.

B22t—18 to 24 inches; grayish brown (10YR 5/2) mixed with some dark grayish brown (10YR 4/2) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate fine prismatic structure parting to moderate very fine and fine subangular blocky; friable; common roots; thin continuous clay films on faces of peds; medium acid; clear smooth boundary.

B23t—24 to 36 inches; grayish brown (10YR 5/2) silty clay loam; many medium prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common roots; moderate continuous gray (10YR 5/1) and thin patchy dark gray (10YR 4/1) clay films on faces of peds; few pebbles; slightly acid; clear smooth boundary.

B24t—36 to 46 inches; grayish brown (10YR 5/2) silty

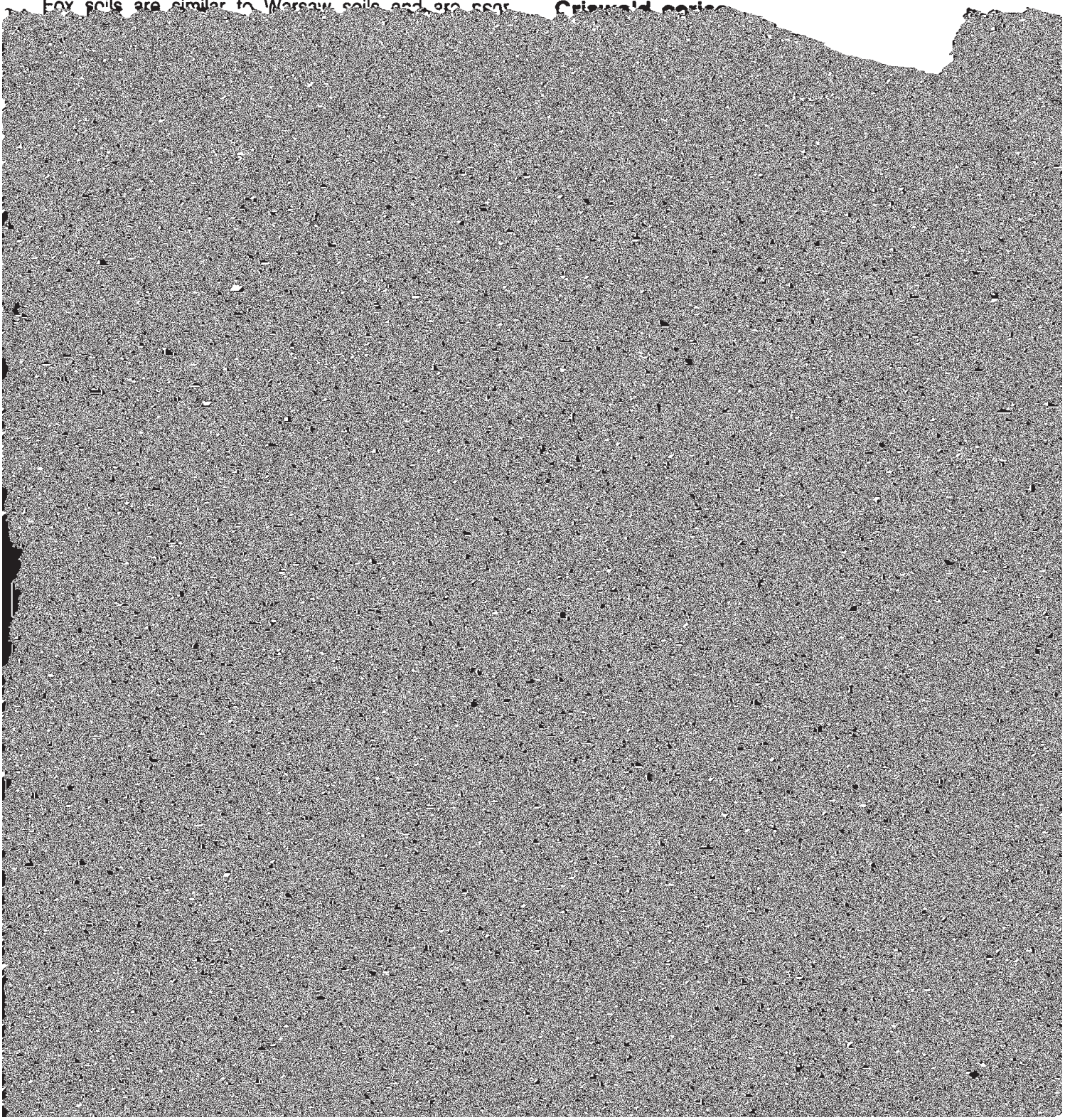


ability in the substratum. These soils formed in loamy outwash overlying stratified, calcareous sand and gravel. They formed under forest vegetation on outwash plains and terraces. Slope ranges from 1 to 5 percent.

Fox soils are similar to Warsaw soils and are near

silty clay loam, but some thin subhorizons range to sandy clay loam. The IIC horizon is sand or gravelly sand.

Griswold series

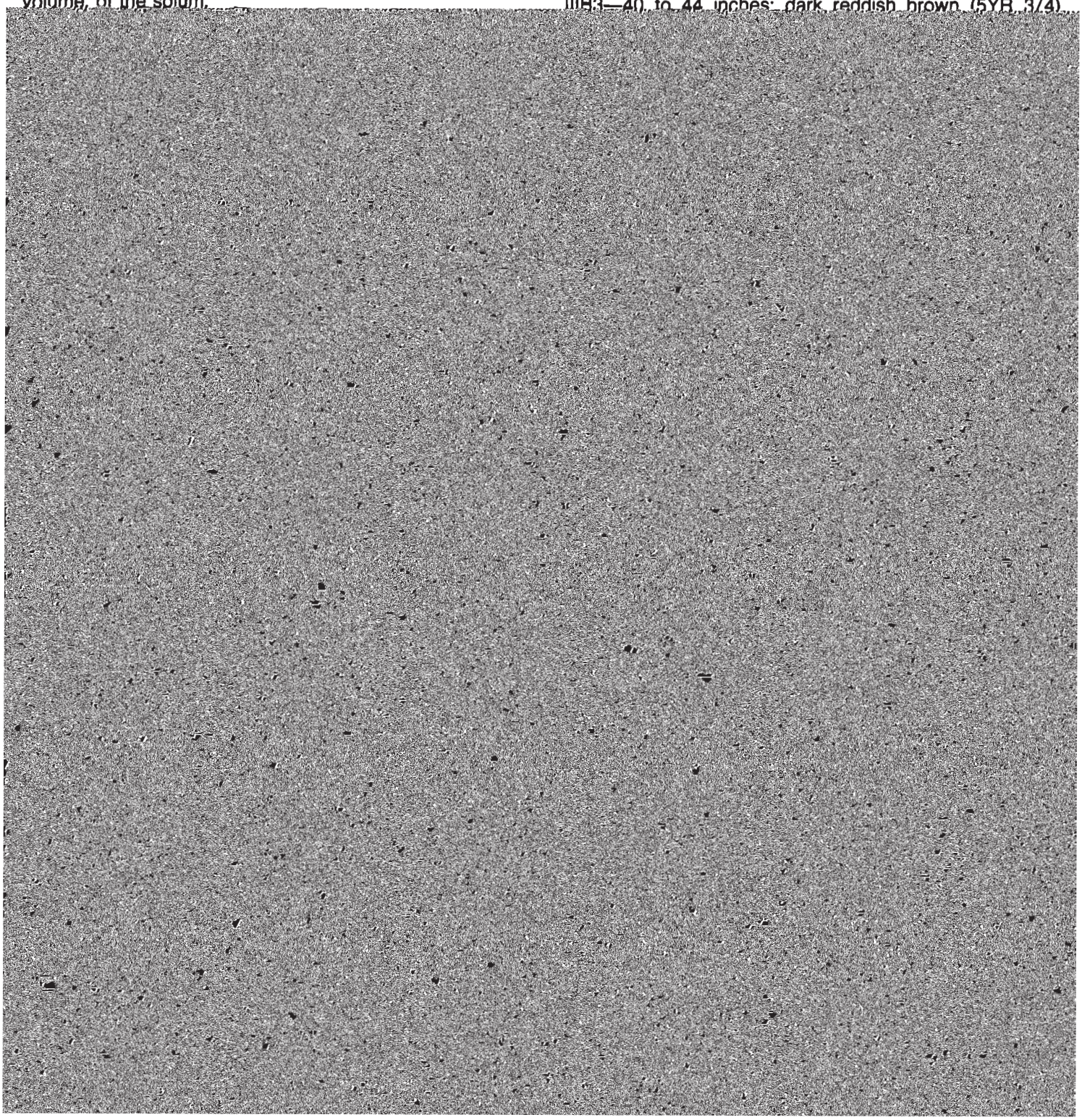


bles, a few 1/2 to 1 inch in diameter; strong effervescence; moderately alkaline.

The solum ranges from 24 to 36 inches in thickness. Coarse fragments make up less than 10 percent, by volume, of the solum.

IIB23t—36 to 40 inches; reddish brown (5YR 4/4) clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; thin patchy dark reddish brown clay films on faces of peds; medium acid; abrupt smooth boundary.

IIB3—40 to 44 inches; dark reddish brown (5YR 3/4)



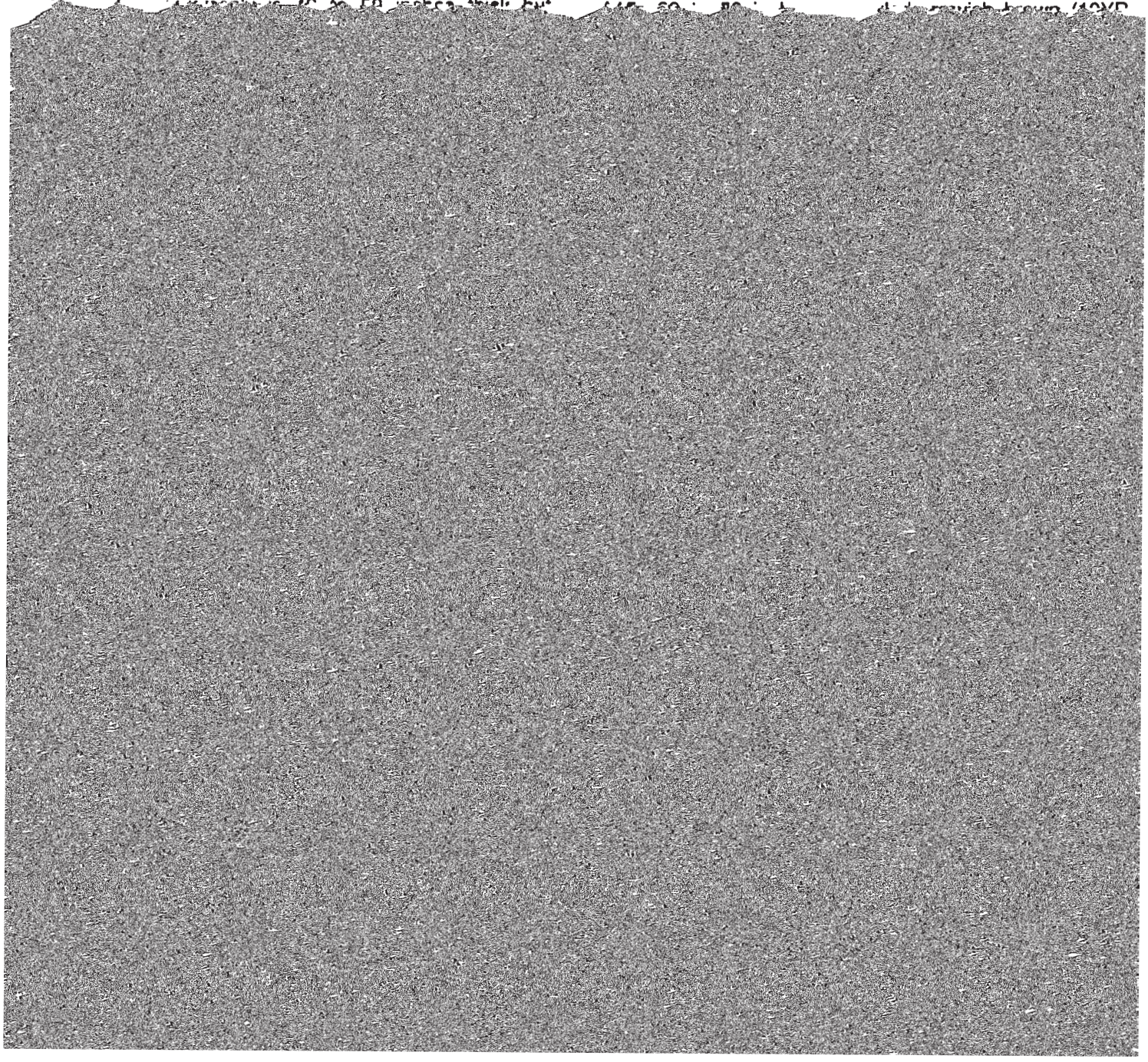
ture; very friable; few fresh roots; about 20 percent mineral soil; mildly alkaline (pH 7.4 in Truog).

The organic layers are more than 51 inches thick and are assumed to be mainly herbaceous. Some pedons contain woody fragments, about 1/2 to 8 inches in diameter, that cannot be crushed between the fingers.

Layers within the control section have hue of 10YR, 7.5YR, 5YR, or neutral; value of 2 or 3; and chroma of 0 through 3. Color of broken surfaces may become darker on brief exposure to air.

grayish brown (10YR 5/2) dry; moderate fine and medium platy structure; friable; common roots; light gray (10YR 7/1) uncoated silt grains on faces of peds; medium acid; abrupt smooth boundary.

A14—32 to 39 inches; mixed very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; few roots; thin patchy very dark gray (10YR 3/1) organic films on faces of peds; medium acid; clear smooth boundary.



(10YR 3/3) clay films on faces of peds; many sand grains visible; neutral; clear smooth boundary.

B21t—22 to 37 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; few roots; thin discontinuous brown (10YR 4/3) clay films on faces of peds; 3-inch strata of brown (10YR 5/3) silt loam near lower part of horizon; medium acid; clear smooth boundary.

B22t—37 to 43 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; few roots; thin discontinuous dark brown (7.5YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

B3—43 to 47 inches; dark yellowish brown (10YR 4/4) loamy sand; weak coarse prismatic structure; very friable; few roots; slightly acid; abrupt smooth boundary.

C—47 to 64 inches; stratified yellowish brown (10YR 5/4) and brown (10YR 5/3) silt loam; few fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; few roots; slightly acid.

The solum ranges from 30 to 48 inches in thickness. The A1 horizon ranges from 10 to 18 inches in thickness. It has color value of 2 or 3 and chroma of 1 or 2. The A horizon is typically loam but is silt loam or fine sandy loam in places. The B horizon has 10YR or 7.5YR hue, value of 4 or 5, and chroma of 4 through 8. The C horizon is silt loam or stratified layers of silt loam to sand.

In map unit 440C2, the surface layer is thinner than defined as the range of the series, but this difference does not alter the use or behavior of the soil.

Kendall series

This series consists of somewhat poorly drained soils that have moderate permeability. These soils formed in 40 to 60 inches of loess and moderately coarse textured glacial outwash. They formed under forest vegetation on outwash plains and stream terraces. Slope ranges from 0 to 3 percent.

Kendall soils are near Birkbeck, Flanagan, Martinsville, and St. Charles soils. Birkbeck, Martinsville, and St. Charles soils have better natural drainage. Flanagan soils have heavier till between depths of 40 and 60 inches.

Typical pedon from an area of Kendall silt loam, 0 to 3 percent slopes, on an outwash plain about 1 mile southwest of Flagg Center, 740 feet south and 1,281 feet west of northeast corner of sec. 20, T. 40 N., R. 1 E.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam, gray (10YR 6/1) dry; moderate fine and medium granular structure; friable; many roots; neutral; clear smooth boundary.

A2—4 to 10 inches; mixed grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) silt loam; weak medium platy structure parting to moderate fine and medium granular; friable; common roots; slightly acid; clear smooth boundary.

B1t—10 to 14 inches; mixed brown (10YR 5/3) and dark brown (10YR 4/3) silty clay loam; few fine faint yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to moderate fine and medium subangular blocky; friable; common roots; thin continuous dark grayish brown (10YR 4/2) and few patchy very dark gray (10YR 3/1) clay films on faces of peds; strongly acid; clear smooth boundary.

B21t—14 to 21 inches; mixed brown (10YR 5/3) and dark brown (10YR 4/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common roots; thin continuous dark grayish brown (10YR 4/2) and thin patchy very dark gray (10YR 3/1) clay films on faces of peds; few fine dark accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

B22t—21 to 28 inches; olive (5Y 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; friable; common roots; thin discontinuous olive gray (5Y 4/2 & 5/2) and moderate discontinuous very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine dark accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

B23—28 to 43 inches; mottled olive gray (5Y 5/2), yellowish brown (10YR 5/6 & 5/8), and dark brown (10YR 4/3 & 3/3) silty clay loam; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm; common roots; some black (10YR 2/1) and dark grayish brown (10YR 3/2) root channel linings; few fine dark accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

IIB3—43 to 46 inches; mottled yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) loam; weak coarse prismatic structure; friable; few roots; few black (10YR 2/1) root channel linings; few fine dark accumulations (iron and manganese oxides); mildly alkaline; abrupt smooth boundary.

IIC1—46 to 52 inches; mottled yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) silt loam; massive; friable; few fine dark concretions (iron and manganese oxides); 15 percent pebbles; mildly alkaline; clear smooth boundary.

IIC2—52 to 61 inches; mottled yellowish brown (10YR 5/4 & 5/6) and grayish brown (10YR 5/2) sandy loam; massive; friable; few roots; a tendency towards weak coarse prismatic structure; 2 percent pebbles; few black (10YR 2/1) root channels; few

fine dark accumulations (iron and manganese oxides); slight effervescence; moderately alkaline.

The solum typically is 45 to 60 inches thick, and it ranges from 44 to 70 inches in thickness. Carbonates are at a depth ranging from 45 to 70 inches.

The A horizon is 10 to 18 inches thick. The A1 horizon has color value of 2 or 3 and chroma of 1 or 2. The Ap horizon, when present, has color value of 4 or 5 and chroma of 2 or 3. The upper part of the B horizon has color value of 4 or 5 and chroma of 3 or 4; the lower part has hue of 10YR, 2.5Y, and less commonly 5Y and chroma of 2 through 6. The IIC horizon is stratified, loamy outwash consisting of layers of silt loam, loam, sandy loam, sandy clay loam, and clay loam. Some pedons have a IIC horizon of sandy loam glacial till.

Kidder series

This series consists of well drained soils that have moderate permeability in the solum and moderately rapid permeability in the substratum. These soils formed in a thin layer of loess over calcareous sandy loam till. They formed under forest vegetation on moraines and till plains. Slope ranges from 2 to 15 percent.

Kidder soils are near Flagg, Martinsville, Miami, and Pecatonica soils. Flagg soils has less sand in the A horizon and the upper part of the B horizon. At least part of the solum of Martinsville soils formed in stratified sand and silt. Miami soils do not have a calcareous sandy loam C horizon at a depth of less than 40 inches. Pecatonica soils have a thicker, redder solum.

Typical pedon from an area of Kidder loam, 5 to 10 percent slopes, eroded, on an upland till plain about 2 1/2 miles north and 1 mile west of Leaf River, 1,566 feet north and 908 feet west of southeast corner of sec. 14, T. 25 N., R. 9 E.

Ap—0 to 5 inches; dark brown (10YR 4/3) mixed with some dark brown (7.5YR 4/4) loam, light brownish gray (10YR 6/2) dry; moderate very fine and fine granular structure; friable; common roots; layer compacted because of tillage; few pebbles; neutral; abrupt smooth boundary.

B21t—5 to 14 inches; dark brown (7.5YR 4/4) clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common roots; thin continuous clay films on faces of peds; few pebbles; slightly acid; clear smooth boundary.

B22t—14 to 20 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; common roots; moderate continuous dark brown (7/5YR 4/4) clay films on faces of peds; few fine dark accumulations (iron and manganese oxides) in lower part of the horizon; medium acid; clear smooth boundary.

B23t—20 to 29 inches; dark yellowish brown (10YR 4/4) clay loam; moderate coarse prismatic structure; firm; common roots; thin continuous dark brown (7.5YR 4/4) clay films on faces of peds; common pebbles; medium acid; abrupt smooth boundary.

B3t—29 to 36 inches; mixed dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) gravelly clay loam; weak coarse prismatic structure; firm; few roots; thick patchy dark yellowish brown (10YR 4/4) clay films on faces of peds; about 15 percent calcareous gravel and a few dolomite cobbles; slight effervescence; mildly alkaline; clear smooth boundary.

C—36 to 60 inches; yellowish brown (10YR 5/6) sandy loam; about 10 percent gravel; strong effervescence; moderately alkaline.

The solum ranges from 24 to 40 inches in thickness. Coarse fragments make up as much as 15 percent, by volume, of the solum.

The Ap horizon typically has color value of 3 or 4 and chroma of 2 or 3. It is loam, silt loam, sandy loam, or fine sandy loam. The A2 horizon, where present, commonly is less than 5 inches thick and has color value of 4 or 5 and chroma of 2 or 3. It is loam, silt loam, or sandy loam. The B2t horizon has hue of 10YR or 7.5YR and value and chroma of 3 or 4. It typically is loam, sandy clay loam, or clay loam. Coarse fragments range from 5 to 35 percent, by volume, of the C horizon.

La Hogue series

This series consists of somewhat poorly drained soils that have moderate permeability. These soils formed in loamy and sandy outwash on stream terraces and plains. They formed under prairie vegetation. Slope ranges from 0 to 3 percent. These soils are shallower to free carbonates, contain less sand throughout, and are less acid throughout the solum than defined as the range of the series. These differences do not alter the use or behavior of the soil.

La Hogue soils are similar to Elburn and Odell soils and are near Canisteo, Comfrey, Dickinson, and Selma soils. Elburn soils have a fine-silty solum. Odell soils contain more clay in the lower part of the B horizon and are underlain by glacial till. Canisteo, Comfrey, and Selma soils are all poorly drained. Dickinson soils are well drained and at higher position on the landscape.

Typical pedon from an area of La Hogue loam on an outwash plain about 2 miles north and 2 miles east of Rochelle, 1,444 feet east and 203 feet south of northwest corner of sec. 8, T. 40 N., R. 2 E.

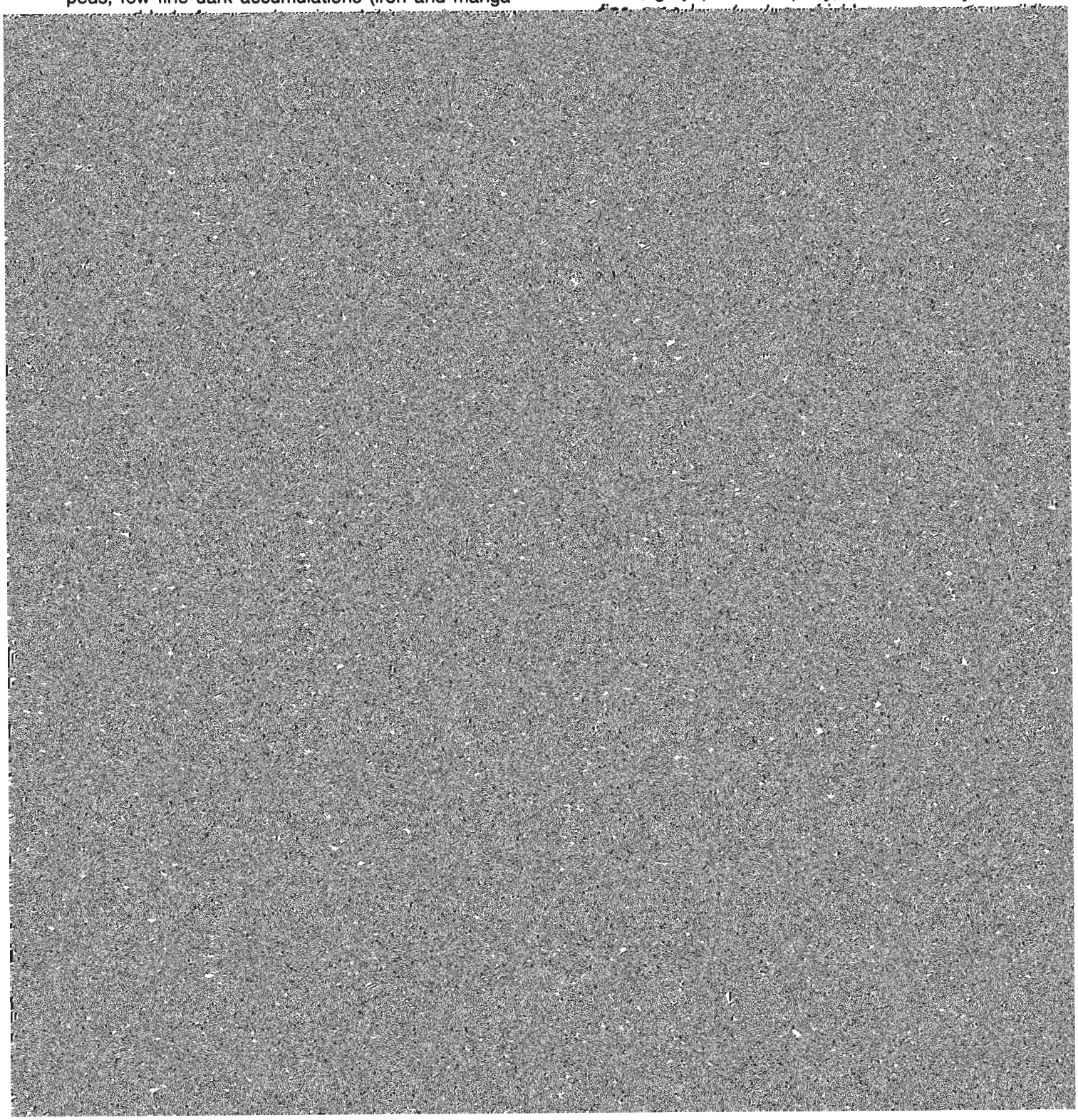
Ap—0 to 10 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; moderate very fine and fine structure; friable; few roots; layer compacted because of tillage; neutral; clear smooth boundary.

A12—10 to 18 inches; mixed very dark grayish brown (10YR 3/2) and black (10YR 2/1) loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; few roots; mildly alkaline; clear smooth boundary.

B1t—18 to 22 inches; dark grayish brown (2.5Y 4/2) clay loam; weak fine and medium subangular blocky structure; friable; few roots; thin continuous very dark grayish brown (2.5Y 3/2) clay films on faces of peds; few fine dark accumulations (iron and manga-

miles south of Oregon, 2,063 feet south and 1,980 feet east of northwest corner of sec. 22, T. 23 N., R. 10 E.

A1—0 to 5 inches; very dark gray (10YR 3/1) sandy loam, gray (10YR 6/1) dry; moderate very fine and



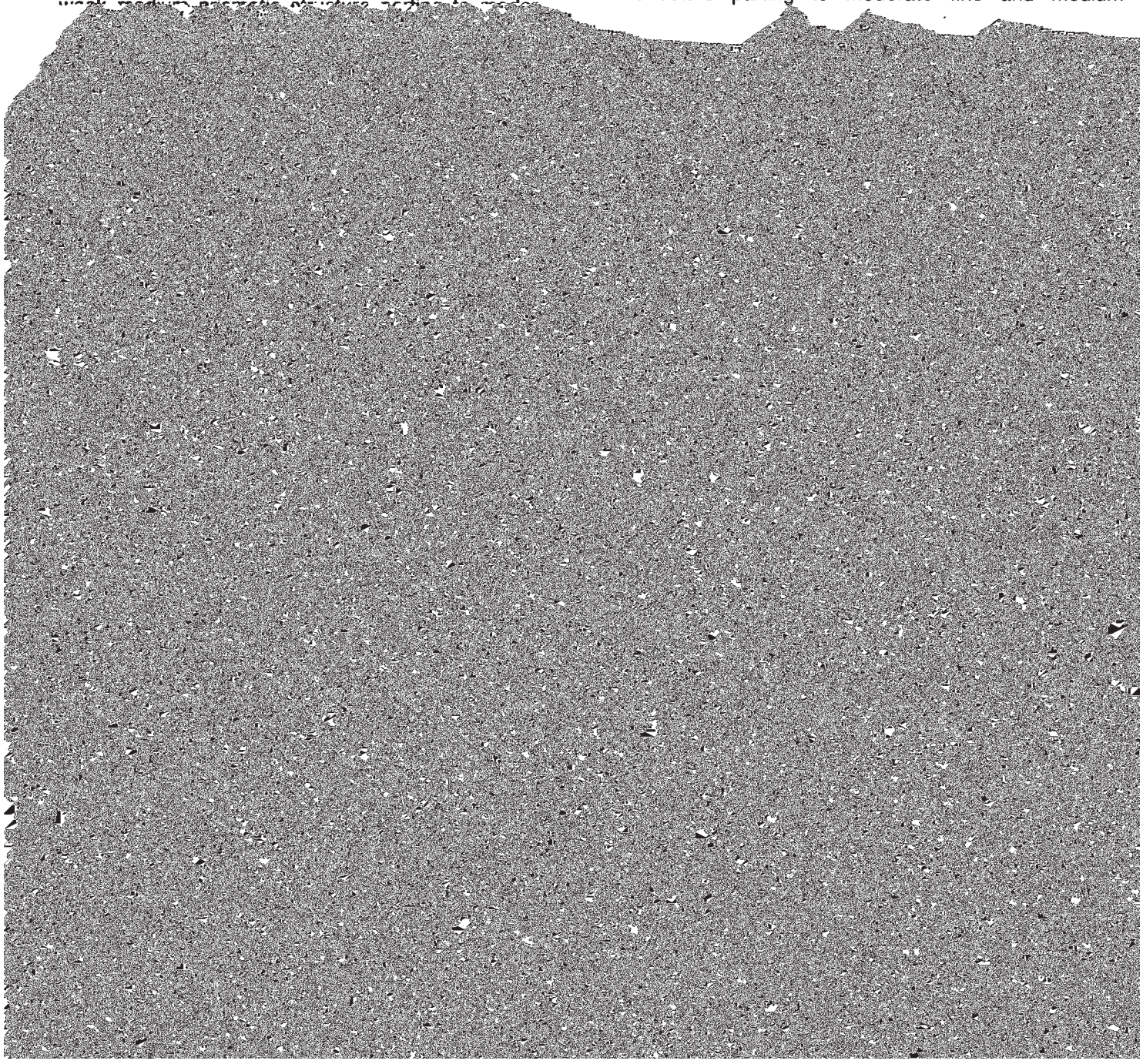
Typical pedon from an area of La Rose silt loam, 5 to 10 percent slopes, eroded, on a convex side slope about 1 mile north of Creston, 886 feet east and 596 feet north of center of sec. 14, T. 40 N., R. 2 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) mixed with some dark brown (7.5YR 4/4) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common roots; layer compacted because of tillage; neutral; abrupt smooth boundary.

B21t—8 to 15 inches; dark brown (7.5YR 4/4) clay loam; weak medium prismatic structure parting to moderate

A12—8 to 20 inches; very dark gray (10YR 3/1) silt loam; grayish brown (10YR 5/2) or brown (10YR 5/3) dry; weak medium platy structure parting to moderate fine and medium granular; friable; common roots; few discontinuous lenses of dark brown (10YR 4/3) silt; mildly alkaline; clear smooth boundary.

A13—20 to 35 inches; black (10YR 2/1) silt loam, gray (10YR 5/1) dry; few fine prominent yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure parting to moderate fine and medium



A21—4 to 7 inches; mixed dark gray (10YR 4/1) and brown (10YR 5/3) silt loam, light gray (10YR 7/1) and white (10YR 8/1) dry; strong thin platy structure; friable; common roots; medium acid; clear smooth boundary.

A22—7 to 11 inches; brown (10YR 5/3) silt loam, mixed light yellowish brown (10YR 6/4) and white (10YR 8/1) dry; moderate thin and medium platy structure; friable; common roots; slightly acid; clear smooth boundary.

B1t—11 to 14 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine and medium subangular blocky structure; friable; common roots; thin discontinuous brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

B21t—14 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common roots; thin discontinuous brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

IIB22t—21 to 26 inches; yellowish brown (10YR 5/6) clay loam; weak fine prismatic structure parting to moderate fine and medium subangular blocky; friable; common roots; thin discontinuous brown (10YR 4/3) and grayish brown (10YR 5/2) clay films on faces of peds; strongly acid; clear smooth boundary.

IIB23t—26 to 36 inches; yellowish brown (10YR 5/6) sandy loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very friable; few roots; thin discontinuous brown (10YR 4/3) clay films and light gray (10YR 7/1) uncoated sand grains on faces of peds;

The A1 horizon has color value of 3 or 4 and chroma of 1 through 4. The Ap horizon, where present, has color value of 4 or 5 and chroma of 2 through 4. It is commonly loam or silt loam and less commonly fine sandy loam or sandy loam. The IIB2 horizon has hue of 10YR, 7.5YR, and less commonly 5YR; value of 4 through 6; and chroma of 3 through 6. The IIB2 horizon is commonly clay loam, but in some pedons, subhorizons are loam, sandy clay loam, silty clay loam, or sandy loam.

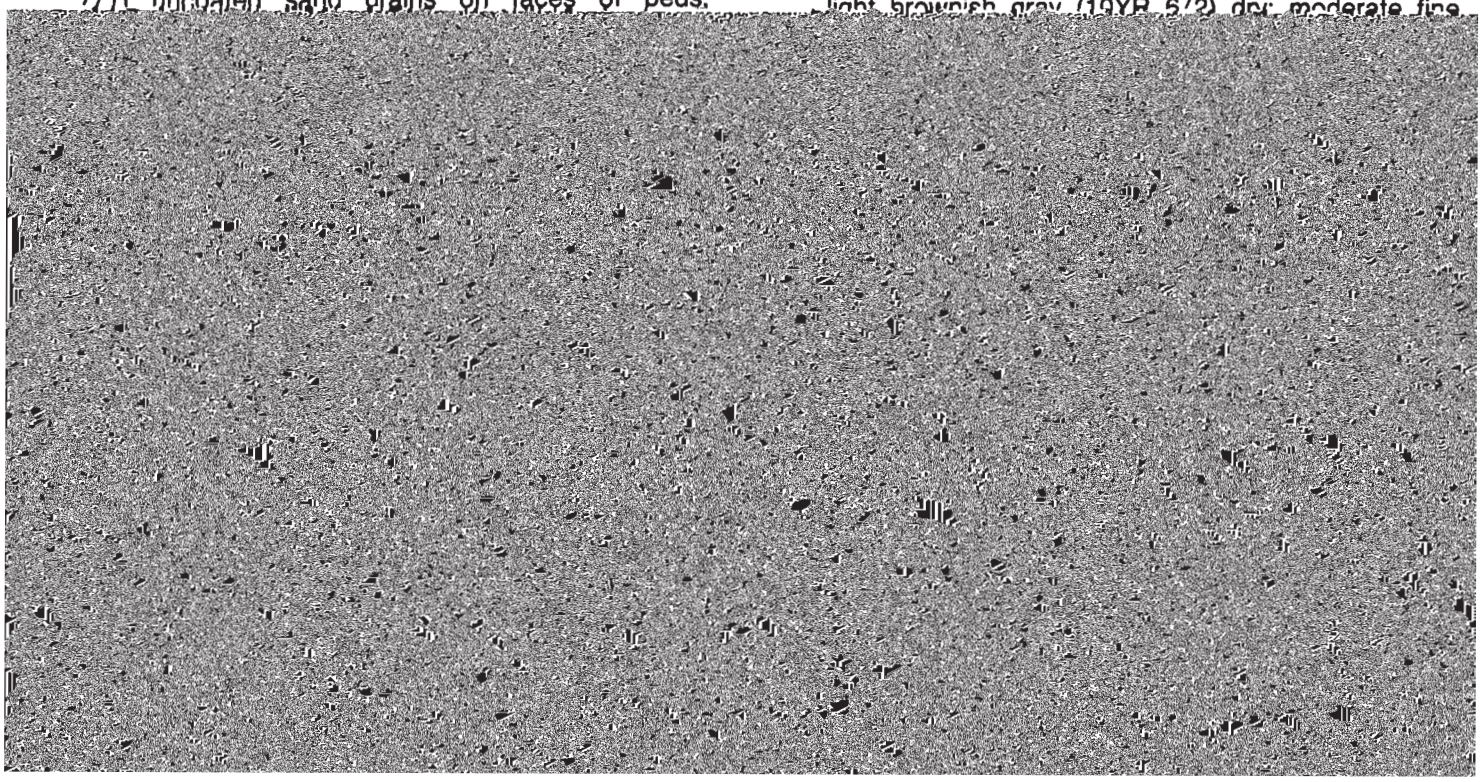
Miami series

This series consists of well drained soils that have moderate permeability. These soils formed in glacial outwash or wind worked deposits over calcareous glacial till. They formed under forest vegetation on uplands. Slope ranges from 2 to 20 percent.

Miami soils are similar to and are near Martinsville, Pecatonica, Whalan, and Woodbine soils. In Martinsville soils, the solum is more than 40 inches thick. Pecatonica soils have redder hues in at least one subhorizon of the subsoil. Whalan and Woodbine soils have more clay in the lower part of the solum and are underlain by limestone and dolomite bedrock.

Typical pedon from an area of Miami loam, 5 to 10 percent slopes, eroded, on the side of an upland ridge about 4 miles northeast of Grand Detour, 1,733 feet north and 413 feet west of southeast corner of sec. 4, T. 22 N., R. 9 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) mixed with some dark yellowish brown (10YR 4/4) loam, light brownish gray (10YR 6/2) dry; moderate fine



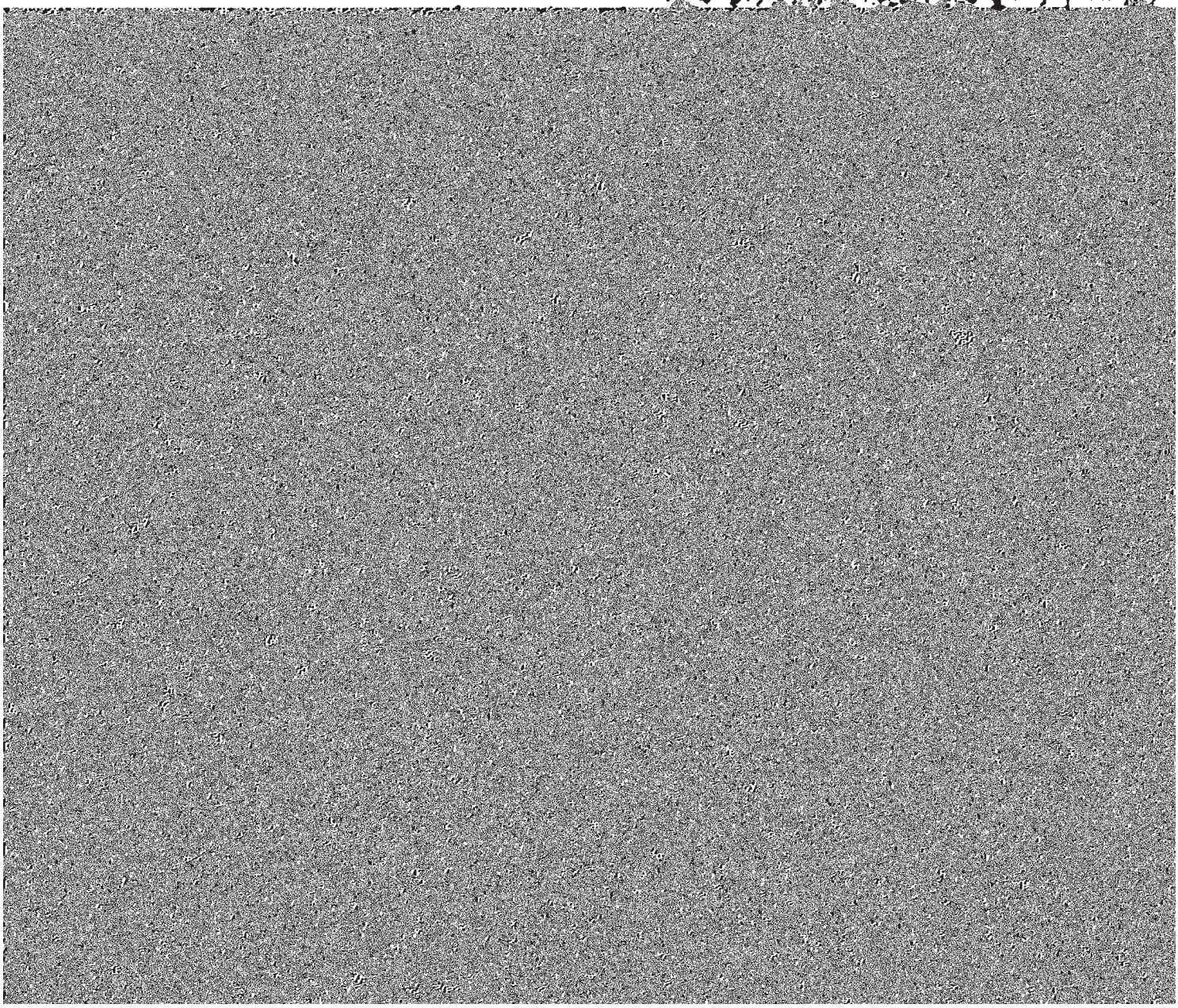
C—34 to 60 inches; yellowish brown (10YR 5/4) loam; massive; friable; 7 percent pebbles; strong effervescence; moderately alkaline.

The solum ranges from 24 to 42 inches in thickness. The Ap horizon has color value of 4 or 5 and chroma of 2 or 3. It typically is loam, but it is silt loam, fine sandy loam, and sandy loam in places. The B2 horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. It commonly is clay loam, but individual horizons are loam, sandy clay loam, silty clay loam, or sandy loam in places. The most acid part of the B2 horizon is medium acid or strongly acid, but individual horizons are neutral or slightly acid in places.

bangular blocky structure; firm; few roots; moderate continuous dark grayish brown (10YR 4/2) clay films on faces of peds; few fine dark concretions (iron and manganese oxides); medium acid; clear smooth boundary.

IIB22t—27 to 33 inches; grayish brown (10YR 5/2) clay loam; many fine distinct yellowish brown (10YR 5/4 & 5/6) mottles; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few roots; moderate continuous dark grayish brown (10YR 4/2) clay films on faces of peds; few fine dark concretions (iron and manganese oxides); medium acid; clear smooth boundary.

IIB23t—33 to 37 inches; mottled yellowish brown (10YR 5/4 & 5/6) strong brown (7.5YR 5/6) and grayish



Typical pedon from an area of Millington silt loam on the Rock River flood plain about 2 miles south of Oregon, 248 feet south and 2,640 feet east of northwest corner of sec. 21, T. 23 N., R. 10 E.

A1—0 to 19 inches; black (10YR 2/1) silt loam, very dark gray (10YR 3/1) rubbed, gray (10YR 5/1) dry; moderate fine granular structure; friable; common roots; some sand grains; slight effervescence; moderately alkaline; gradual smooth boundary.

B2—19 to 38 inches; very dark gray (10YR 3/1) loam; gray (10YR 5/1) dry; weak fine and very fine subangular blocky structure; friable; few roots; few visible snail shells; violent effervescence; moderately alkaline; gradual smooth boundary.

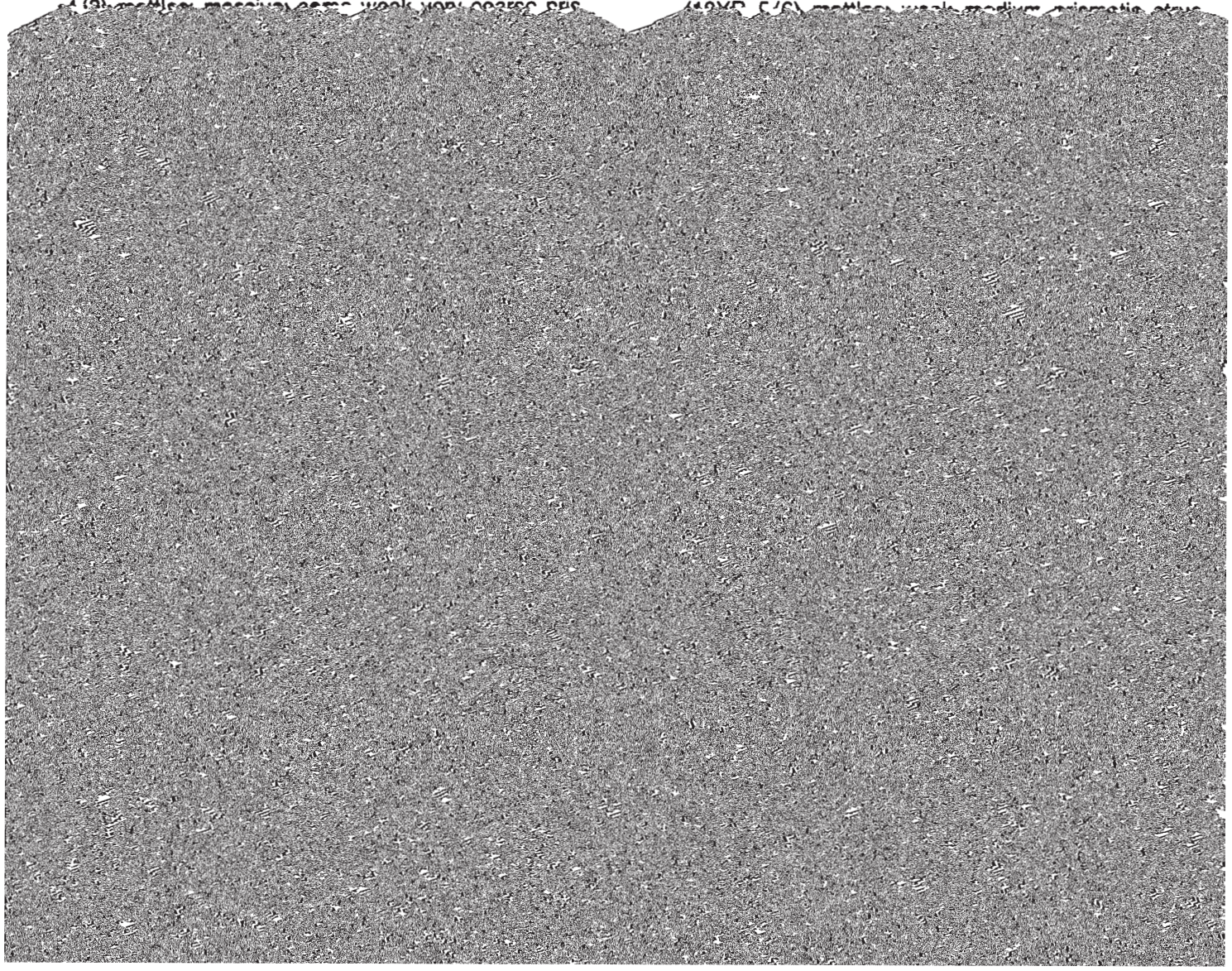
C1g—38 to 53 inches; dark gray (10YR 4/1) with some very dark gray (10YR 3/1) loam; few fine distinct yellowish brown (10YR 5/4) and dark brown (10YR [illegible]

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate, fine and medium granular structure; friable; common roots; layer compacted because of agricultural practices; neutral; abrupt smooth boundary.

A12—7 to 16 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common roots; medium acid; clear smooth boundary.

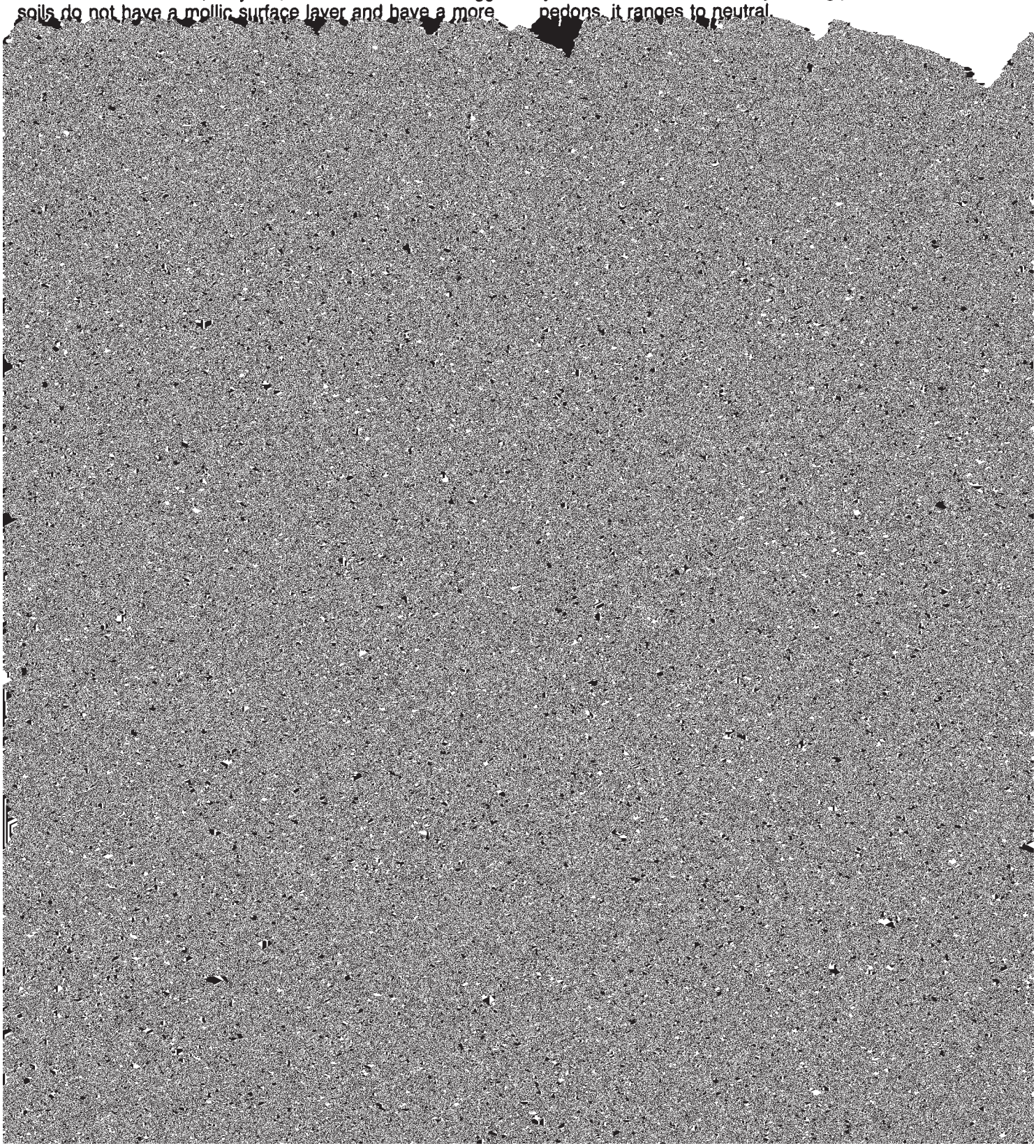
B1t—16 to 22 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to moderate fine and very fine granular; friable; common roots; thin continuous very dark gray (10YR 3/1) clay films on faces of peds; medium acid; clear smooth boundary.

B21t—22 to 31 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct yellowish brown [illegible]



Myrtle soils are similar to Downs, Flagg, and Ogle soils and are near Downs, Fayette, and Tama soils. Flagg soils do not have a mollic surface layer and have a more

The solum commonly is 5 feet or more thick. It typically is medium acid to very strongly acid, but in some pedons, it ranges to neutral.



IIB24t—37 to 43 inches; dark brown (7.5YR 4/4) gravelly clay loam; weak coarse subangular blocky structure; friable; few roots; thin patchy dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; clear smooth boundary.

IIB25—43 to 55 inches; dark brown (7.5YR 3/2 & 4/4) gravelly clay loam; weak coarse subangular blocky structure; friable; slightly acid; clear wavy boundary.

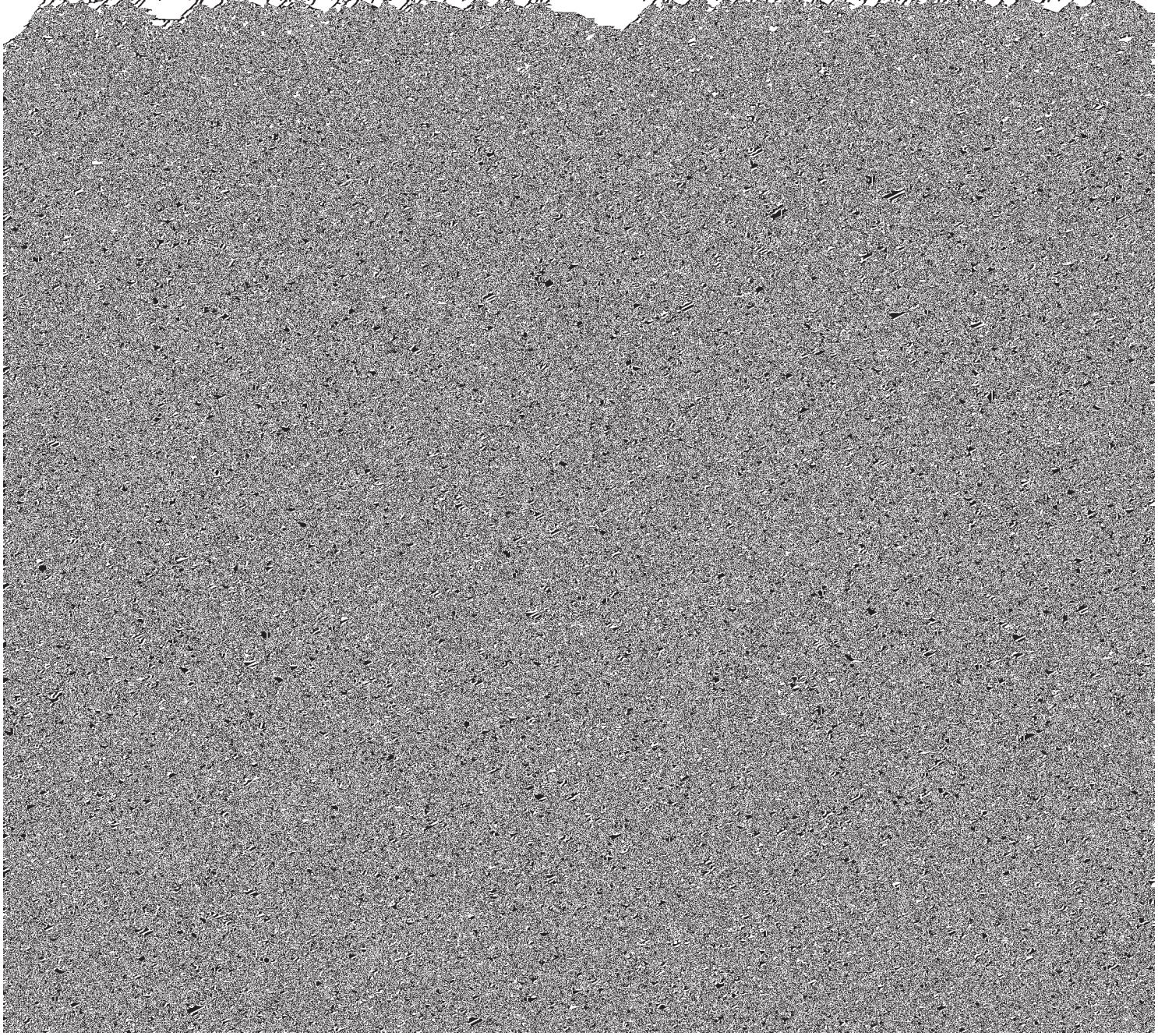
IIC—55 to 60 inches; yellowish brown (10YR 5/4) sand and gravel; single grained; loose; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 40 to 60

B2t—19 to 25 inches; olive brown (2.5Y 4/4) clay loam; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; friable; few roots; thin discontinuous dark grayish brown (2.5Y 4/2) clay films on faces of peds; mildly alkaline; clear smooth boundary.

C1—25 to 30 inches; mottled light olive brown (2.5Y 5/4) grayish brown (2.5Y 5/2) and olive yellow (2.5Y 6/6) loam; weak coarse prismatic structure; friable; few roots; many pebbles; slight effervescence; moderately alkaline; clear smooth boundary.

C2—30 to 60 inches; mottled light olive brown (2.5Y 5/4 and 5/6) and light brownish gray (2.5Y 6/2) loam;



B21t—11 to 16 inches; dark brown (10YR 4/3) silty clay loam; weak fine prismatic structure parting to moderate very fine and fine subangular blocky; friable; common roots; thin discontinuous dark brown (10YR 3/3) clay films on faces of peds; some very dark gray (10YR 3/1) root channel fillings; neutral; clear smooth boundary.

B22t—16 to 23 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate very fine and fine subangular blocky; [illegible] thin discontinuous dark

20 to 40 inches of recently deposited silty alluvium over older silty alluvium. They formed on floodplains. Slope ranges from 0 to 3 percent.

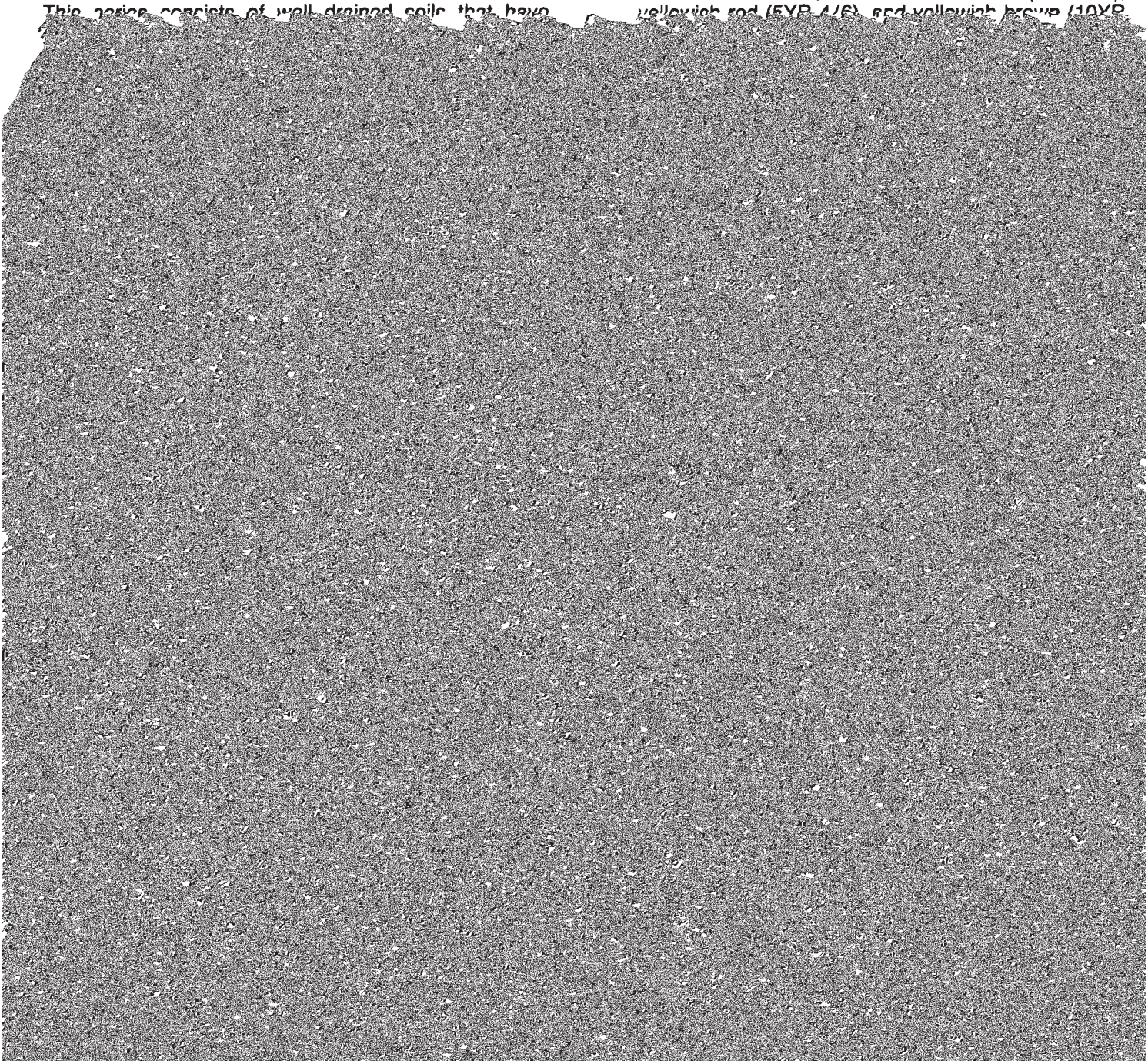
Orion soils are near Comfrey, Martinsville, Radford, and Sawmill soils. Comfrey, Radford, and Sawmill soils have a mollic surface layer. Martinsville soils have a thinner surface layer and have more sand in the solum than the Orion soils.

Typical pedon from an area of Orion silt loam on a flood plain about 3 1/2 miles north of Oregon, 427 feet east and 267 feet north of center of sec. 31, T. 24 N., R.

by gley characteristics resulting from poor drainage. Color, arrangement, and thickness of all horizons is quite variable principally as a result of the source of the sediment and the method of deposition. The Ab horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. In some pedons, the Ab horizon has high chroma mottles. The C horizon is 5 to 20 percent, by volume, sand, chert, or gravel.

Palsgrove series

This series consists of well drained soils that have



7/1) uncoated silt grains on faces of peds; medium acid; clear smooth boundary.

B24t—35 to 48 inches; mixed yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) silty clay loam; moderate coarse prismatic structure; friable; few roots; thin discontinuous dark brown (10YR 3/3) clay films on faces of peds; few fine dark accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

IIB25t—48 to 54 inches; mixed reddish brown (5YR 4/4), *yellowish red (5YR 4/6), and yellowish brown (10YR*

Figure 12.—Roadcut showing glacial till subsoil of Parr loam, 2 to 5 percent slopes.

Ap—0 to 7 inches; very dark brown (10YR 2/2) loam; dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; friable; many roots; medium acid; abrupt smooth boundary.

A3—7 to 12 inches; mixed very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) loam; grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common roots; medium acid; clear smooth boundary.

B21t—12 to 18 inches; brown (10YR 4/3) clay loam; moderate fine and medium subangular blocky structure; friable; few roots; thin discontinuous dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

B22t—18 to 29 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; few roots; thin discontinuous brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

C—29 to 60 inches; mixed yellowish brown (10YR 5/4 & 5/6) loam; massive; friable; few roots; 4 percent pebbles; slight effervescence, moderately alkaline.

The thickness of the solum ranges from 24 to 42 inches and commonly is the same as depth to carbonates. In places, a layer of loess as much as 18 inches thick is on the surface.

The A horizon has color value of 2 or 3 and chroma of 1 or 2. It is loam, silt loam, or less commonly fine sandy loam. The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is commonly clay loam or loam, but subhorizons range to silty clay loam. The C horizon is loam or clay loam.

In map unit 221C2, the surface layer is thinner than is defined as the range for the series, but this difference does not alter the use or the behavior of the soil.

Pecatonica series

This series consists of well drained soils that have moderate permeability. These soils formed in loess and in reddish buried soils weathered from glacial drift. They formed under forest vegetation on uplands. Slope ranges from 2 to 15 percent.

Pecatonica soils are similar to and near the Flagg, Kidder, Martinsville, and Miami soils. Flagg soils contain more silt and are deeper to glacial till. Kidder and Miami soils have a thinner solum and are underlain by yellowish colored glacial till. Martinsville soils have a thinner loess layer and have more sand in the upper part of the subsoil.

Typical pedon from an area of Pecatonica silt loam, 2 to 5 percent slopes, on the edge of an upland ridge about 5 1/2 miles northwest of Byron, 2,298 feet west and 897 feet south of northeast corner of sec. 10, T. 25 N., R. 10 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) mixed with some yellowish brown (10YR 5/4) silt loam, light gray (10YR 7/1) dry; moderate very fine and fine granular structure; friable; common roots; layer compacted because of agricultural practices; neutral; abrupt smooth boundary.

A2—6 to 11 inches; dark yellowish brown (10YR 4/4) silt loam; lower part of horizon has heavier texture; weak thin and medium platy structure; friable; common roots; some very dark grayish brown (10YR 3/2) root channel fillings; slightly acid; clear smooth boundary.

B21t—11 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common roots; thin continuous dark brown (10YR 4/3) clay films and thin light gray (10YR 7/1) uncoated silt grains on faces of peds; strongly acid; clear smooth boundary.

B22t—18 to 22 inches; strong brown (7.5YR 5/6) mixed with some yellowish red (5YR 4/6) silty clay loam; weak fine prismatic structure parting to moderate fine and medium subangular blocky; friable; few roots; thin continuous dark brown (10YR 4/3) clay films and light gray (10YR 7/1) uncoated silt grains on faces of peds; some sand grains visible; very strongly acid; clear smooth boundary.

IIB23t—22 to 33 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; friable; few roots; moderate continuous reddish brown (5YR 4/4) clay films and thin very pale brown (10YR 7/3) uncoated grains on faces of peds; some pebbles; very strongly acid; clear smooth boundary.

IIB24t—33 to 44 inches; yellowish red (5YR 5/6) sandy loam; moderate coarse prismatic structure; friable; few roots; moderate discontinuous reddish brown (5YR 4/4) clay films on faces of peds; some pebbles; very strongly acid; clear smooth boundary.

IIB3—44 to 51 inches; yellowish red (5YR 5/6) sandy loam; weak coarse prismatic structure; friable; few roots; some pebbles; a few thin continuous coatings in root channels; very strongly acid; gradual smooth boundary.

IIC—51 to 60 inches; yellowish red (5YR 5/8) sandy loam; massive; friable; few roots; very strongly acid.

The solum ranges from 4 to 8 feet or more in thickness.

In uncultivated areas, the A1 horizon that is less than 5 inches thick has color value of 2 or 3 and chroma of 1 or 2. The A2 horizon has color value of 4 to 6 and chroma of 2 to 4. The upper part of the B horizon is silt loam or silty clay loam. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 6. The IIB2 horizon ranges from 7.5YR to 2.5YR in hue. It is commonly sandy loam but it ranges to sandy clay loam, clay loam, or loam. The C horizon is noncalcareous in some pedons where the bedrock is 5 to 8 feet below the surface. Where present, the C horizon ranges from gravelly light sandy loam to sandy loam or loam.

Plano series

This series consists of moderately well drained soils that have moderate permeability. These soils formed in 40 to 60 inches of loess or other silty material and loamy stratified outwash. They formed under prairie vegetation on upland till and outwash plains and stream terraces. Slope ranges from 0 to 10 percent.

Plano soils are similar to Catlin, Ogle, and Tama soils and are near the Elburn, Ogle, and Sidell soils. Catlin soils contain less sand and more clay in the IIB and IIC horizons. Tama soils contain less sand in the lower part of the solum and do not have a IIB horizon. Ogle soils contain more clay in the IIB horizon, which formed from a reddish buried soil. Elburn soils are somewhat poorly drained. Sidell soils contain more sand within a depth of 40 inches.

Typical pedon from an area of Plano silt loam, 2 to 5 percent slopes, on an outwash plain about 2 miles northeast of Monroe Center, 976 feet west and 49 feet south of northeast corner of sec. 15, T. 42 N., R. 2 E.

Ap—0 to 8 inches; very dark gray (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate very fine and fine granular structure; friable; many roots; layer compacted because of tillage; slightly acid; abrupt smooth boundary.

A12—8 to 14 inches; mixed dark brown (10YR 3/3) and very dark grayish brown (10YR 3/2) silt loam; grayish brown (10YR 5/2) dry; moderate very fine and fine granular structure; friable; many roots; slightly acid; clear smooth boundary.

B1t—14 to 20 inches; dark brown (10YR 4/3) silty clay loam; moderate very fine and fine subangular blocky structure; friable; common roots; thin continuous dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

B21t—20 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common roots; thin continuous dark brown (10YR 4/3 & 3/3) clay films on faces of peds; few very dark brown (10YR 2/2) root channel fillings present; medium acid; clear smooth boundary.

B22t—28 to 35 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong fine and medium subangular blocky structure; firm; common roots; thin continuous dark brown (10YR 4/3) and thin patchy dark brown (7.5YR 4/2) clay films on faces of peds; medium acid; clear smooth boundary.

B23t—35 to 46 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to strong medium and coarse subangular blocky; firm; few roots; thin discontinuous dark brown (7.5YR 4/2) clay films on faces of peds; bright mottles in lower part; medium acid; clear smooth boundary.

IIB3t—46 to 53 inches; mixed brown (10YR 5/3) and yellowish brown (10YR 5/4) loam; common fine distinct yellowish brown (10YR 5/6 & 5/8) and few fine distinct grayish brown (10YR 5/2) mottles; weak coarse subangular blocky structure; friable; few roots; thin patchy dark accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

IIC—53 to 62 inches; yellowish brown (10YR 5/4) stratified loam and sandy loam; massive; friable; neutral.

The solum ranges from 44 to 70 inches in thickness. Carbonates are at a depth ranging from 45 to 70 inches.

The A horizon ranges from 10 to 18 inches in thickness. The A1 or Ap horizon has color value of 2 or 3

and chroma of 1 through 3. The B horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 3 or 4. The C horizon is commonly stratified outwash, but in a few pedons, it is sandy loam till.

In map unit 199C2, the surface layer is thinner than is defined as the range for the series, but this difference does not alter the use or behavior of the soil.

Radford series

This series consists of somewhat poorly drained soils that have moderate permeability. These soils formed in recent, silt loam alluvium, which is 20 to 40 inches thick over an older buried soil. They formed under prairie vegetation and scattered trees on bottom lands. Slope ranges from 0 to 3 percent.

Radford soils are similar to Lawson soils and are near Comfrey, Drummer, Sawmill, and Selma soils. Lawson soils do not have a buried, mollic silty clay loam horizon within a depth of 40 inches. Comfrey, Drummer, Sawmill, and Selma soils are poorly drained.

Typical pedon from an area of Radford silt loam about 1/2 mile east of Kings near Illinois Route 64, 325 feet east and 573 feet south of northwest corner of sec. 26, T. 41 N., R. 1 E.

A11—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; many roots; mildly alkaline; clear smooth boundary.

A12—8 to 18 inches; very dark gray (10YR 3/1) silt loam; gray (10YR 5/1) dry; moderate fine and medium granular structure; friable; common roots; few dark stains (iron and manganese oxides); neutral; clear smooth boundary.

C—18 to 28 inches; very dark gray (10YR 3/1) silt loam; gray (10YR 5/1) dry; thin strata of dark grayish brown (10YR 4/2); weak thin platy structure parting to moderate medium granular; friable; common roots; common fine dark stains (iron and manganese oxides); neutral; abrupt wavy boundary.

A11b—28 to 49 inches; black (N 2/0) silty clay loam; dark gray (N 4/0) dry; moderate medium and coarse subangular blocky structure; friable; few roots; mildly alkaline; gradual smooth boundary.

A12b—49 to 60 inches; black (10YR 2/1) silty clay loam; weak coarse prismatic structure parting to moderate coarse subangular blocky; friable; some sand grains visible; mildly alkaline.

Ripon series

The Ripon series consists of well drained soils that have moderate permeability. These soils formed in loess and glacial drift over dolomite bedrock. They formed under prairie vegetation on bedrock uplands. Slope ranges from 2 to 10 percent. This soil has a surface layer that is thinner than is defined as the range for the series, but this difference does not alter the use or behavior of the soil.

Ripon soils are similar to Ashdale, Ogle, Rockton, and Tama soils and are near Ashdale, Ogle, Sogn, and Tama soils. Rockton soils have more sand in the solum. Ashdale, Ogle, and Tama soils do not have limestone or dolomite bedrock at a depth of less than 40 inches. Sogn soils have limestone or dolomite bedrock at a depth of less than 20 inches.

Typical pedon from an area of Ripon silt loam, 5 to 10 percent slopes, eroded, on a bedrock upland about 1 1/2 miles east and 3/4 mile south of Egan, 380 feet west and 819 feet north of southeast corner of sec. 7, T. 25 N., R. 10 E.

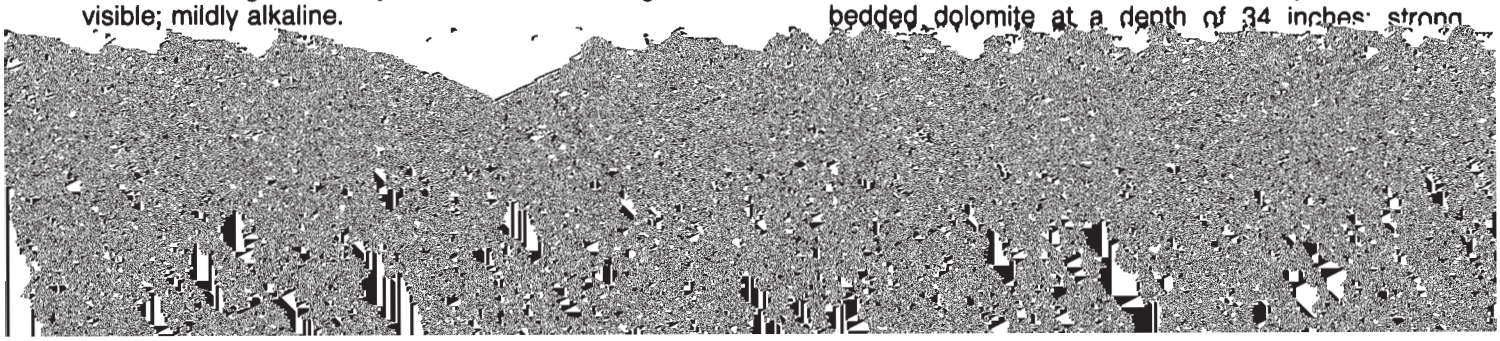
Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) mixed with some dark brown (10YR 4/3) silt loam; grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few roots; layer compacted because of tillage; neutral; abrupt smooth boundary.

B21t—7 to 14 inches; dark brown (10YR 4/3) silty clay loam; weak fine and medium subangular blocky structure; friable; common roots; thin discontinuous dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

B22t—14 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium subangular blocky structure, very weak prismatic structure in places; friable; common roots; thin discontinuous dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

IIB23t—24 to 31 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse subangular blocky structure, weak very prismatic structure in places; friable; few roots; thin discontinuous dark brown (7.5YR 4/4) clay films on faces of peds; lowest 1 inch is reddish brown (5YR 4/4) clay; few pebbles; slightly acid; abrupt wavy boundary.

IIR—31 to 34 inches; brownish yellow (10YR 6/6) weathered dolomite and limestone; hard level bedded dolomite at a depth of 34 inches; strong



7.5YR, value of 4 or 5, and chroma of 3 or 4. It is silt loam or silty clay loam. It ranges from slightly acid to strongly acid. The IIB2t horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 3 or 4. It is clay loam, sandy clay loam, or loam. Thin layers of clayey residuum cap the bedrock in some pedons. Coarse fragments in the IIB horizon range to as much as 7 percent, by volume; they are mostly limestone fragments.

Rockton series

This series consists of well drained soils that have moderate permeability. These soils formed in loamy glacial drift and limestone residuum underlain by limestone bedrock at a depth of 20 to 40 inches. They formed under prairie vegetation on uplands. Slope ranges from 2 to 10 percent.

Rockton soils are similar to Atkinson, Jasper, and Parr soils and are near Atkinson, Dickinson, Jasper, and Parr soils. These soils do not have bedrock within a depth of 40 inches.

Typical pedon from an area of Rockton silt loam, 2 to 5 percent slopes, on bedrock uplands about 2 1/2 miles southwest of Kings, 1,409 feet west and 690 feet north of southeast corner of sec. 32, T. 41 N., R. 1 E.

Ap—0 to 7 inches; black (10YR 2/1) silt loam, gray (10YR 5/1) dry; moderate very fine and fine granular structure; friable; common roots; noticeable sand grains; neutral; abrupt smooth boundary.

A12—7 to 16 inches; black (10YR 2/1) with some dark brown (10YR 3/3) silt loam, gray (10YR 5/1) dry; moderate fine and medium granular structure; friable; common roots; noticeable sand grains; slightly acid; clear smooth boundary.

A3—16 to 22 inches; mixed very dark gray (10YR 3/1) and dark brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; few roots; slightly acid; clear smooth boundary.

B2t—22 to 27 inches; brown (10YR 4/3) clay loam; moderate fine and medium subangular blocky structure; friable; few roots; thin discontinuous very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) clay films on faces of peds; slightly acid; abrupt smooth boundary.

IIB22t—27 to 29 inches; dark yellowish brown (10YR 4/4) clay; moderate medium rectangular blocky structure; firm; thin discontinuous very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) clay films on faces of peds; slightly acid; abrupt smooth boundary.

IIR—29 inches; dolomite bedrock, weathered along joints and partly fractured in upper few inches.

The thickness of the solum and depth to bedrock range from 20 to 40 inches. The A horizon and the upper part of the B horizon typically range from strongly acid through slightly acid, and the IIB horizon ranges from medium acid through neutral.

The dark colored surface layer ranges from 10 inches to more than 22 inches in thickness. The A horizon has color value of 2 or 3 and chroma of 1 or 2. It typically is silt loam, but it is loam and sandy loam in places. The B horizon has 10YR hue in the upper part and 10YR, 7.5YR, or 5YR in the lower part. It has value of 4 or 5 and chroma of 3 or 4. The B horizon is loam, sandy clay loam, clay loam, or clay.

In map unit 503C2, the surface layer is thinner than is defined as the range for the series. This does not alter the use or behavior of the soil.

Rodman series

This series consists of excessively drained soils that have very rapid permeability. These soils formed in calcareous sand and gravel. They formed under prairie grasses and trees on moraines. Slope ranges from 8 to 25 percent. These soils do not have a B horizon and are coarser textured than is defined for the series, but this difference does not alter the use or behavior of the soils.

Rodman soils are near Fox, Jasper, and Warsaw soils. Fox and Warsaw soils are deeper to sand and gravel. Jasper soils have more clay and less sand in the solum, and they also have a much thicker solum than Rodman soils.

Typical pedon of Rodman gravelly loam from an area of Rodman-Fox complex, 12 to 20 percent slopes, on a kame terrace near Kilbuck Creek, about 2 miles east and 3 miles north of Davis Junction, 1,650 feet west and 2,640 feet south of corner of sec. 1, T. 42 N., R. 1 E.

A1—0 to 8 inches; very dark brown (10YR 2/2) gravelly loam, very dark grayish brown (10YR 3/2) dry; a few individual tongues are as much as 17 inches thick; moderate very fine and fine granular structure; very friable; many roots; 22 percent pebbles, slight effervescence; mildly alkaline; abrupt irregular boundary.

C1—8 to 15 inches; mixed yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) very gravelly coarse sand; single grained; loose; few roots; pebbles range up to 4 inches in diameter; 53 percent pebbles; strong effervescence; moderately alkaline; clear smooth boundary.

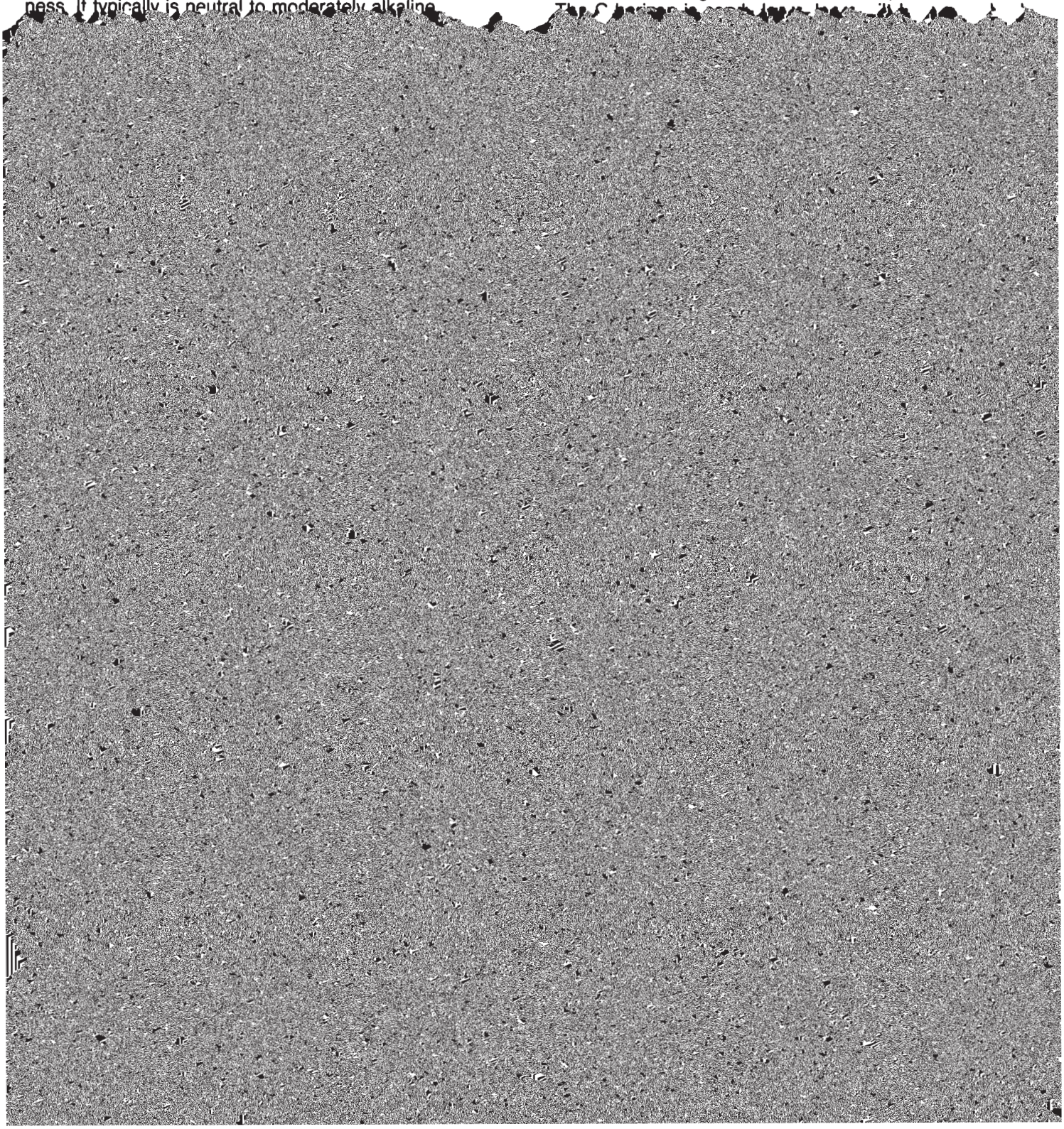
C2—15 to 20 inches; dark brown (7.5YR 4/4) very gravelly loamy coarse sand; single grained; loose; few roots; many pebbles range up to 4 inches in diameter; 68 percent pebbles; strong effervescence; moderately alkaline; clear smooth boundary.

C3—20 to 60 inches; stratified brownish yellow (10YR 6/6), yellowish brown (10YR 5/6), dark brown (10YR 4/3), and dark yellowish brown (10YR 4/4) gravelly coarse sand; single grained; loose; many pebbles range up to 4 inches in diameter; 23 per-

cent pebbles; strong effervescence; moderately alkaline.

The solum ranges from about 8 to 15 inches in thickness. It typically is neutral to moderately alkaline

coarse fragments for gravelly analogs. The B horizon is loam or silt loam. Reaction dominantly ranges from slightly acid to mildly alkaline; some pedons are weakly calcareous throughout or in the lower part of the solum.



continuous brown (10YR 5/3) clay films on faces of peds; many fine dark accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

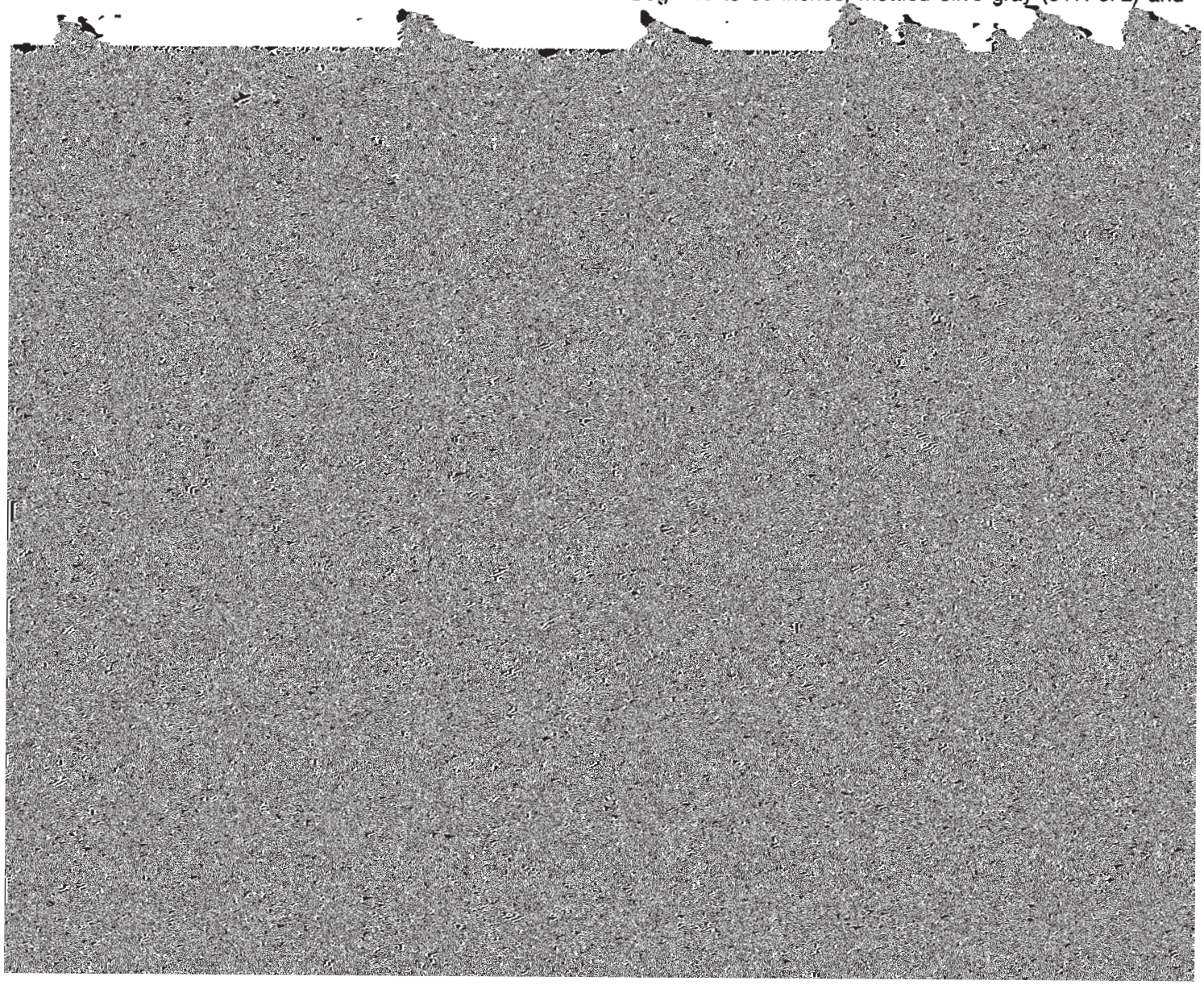
B3—34 to 49 inches; mottled dark yellowish brown (10YR 4/4) and light olive brown (2.5Y 5/4) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and few medium prominent light brownish gray (2.5Y 6/2) mottles; friable; few roots; many fine dark accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

C—49 to 60 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct light brownish gray (2.5Y 6/2) mottles; massive; firm; common roots; few vertical cleavage planes present; few fine dark accumulations (iron and manganese oxides); medium acid.

B21g—20 to 26 inches; olive gray (5Y 5/2) silty clay loam; few fine distinct olive (5Y 5/4) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few roots; thin discontinuous dark gray (5Y 4/1) clay films on faces of peds; mildly alkaline; clear smooth boundary.

B22g—26 to 40 inches; olive gray (5Y 5/2) with some olive (5Y 5/3) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; moderate fine and medium prismatic structure; friable; few roots; medium subangular blocky structure in upper part of horizon; thin discontinuous dark gray (5Y 4/1) and gray (5Y 5/1) clay films on faces of peds; very dark gray (5Y 3/1) krotovina present; few fine dark concretions (iron and manganese oxides); mildly alkaline; gradual smooth boundary.

B3g—40 to 60 inches; mottled olive gray (5YR 5/2) and



blocky structure; friable; few roots; mildly alkaline; clear smooth boundary.

Ap—0 to 8 inches; very dark gray (10YR 3/1) mixed with some very dark grayish brown (10YR 3/2) silt loam

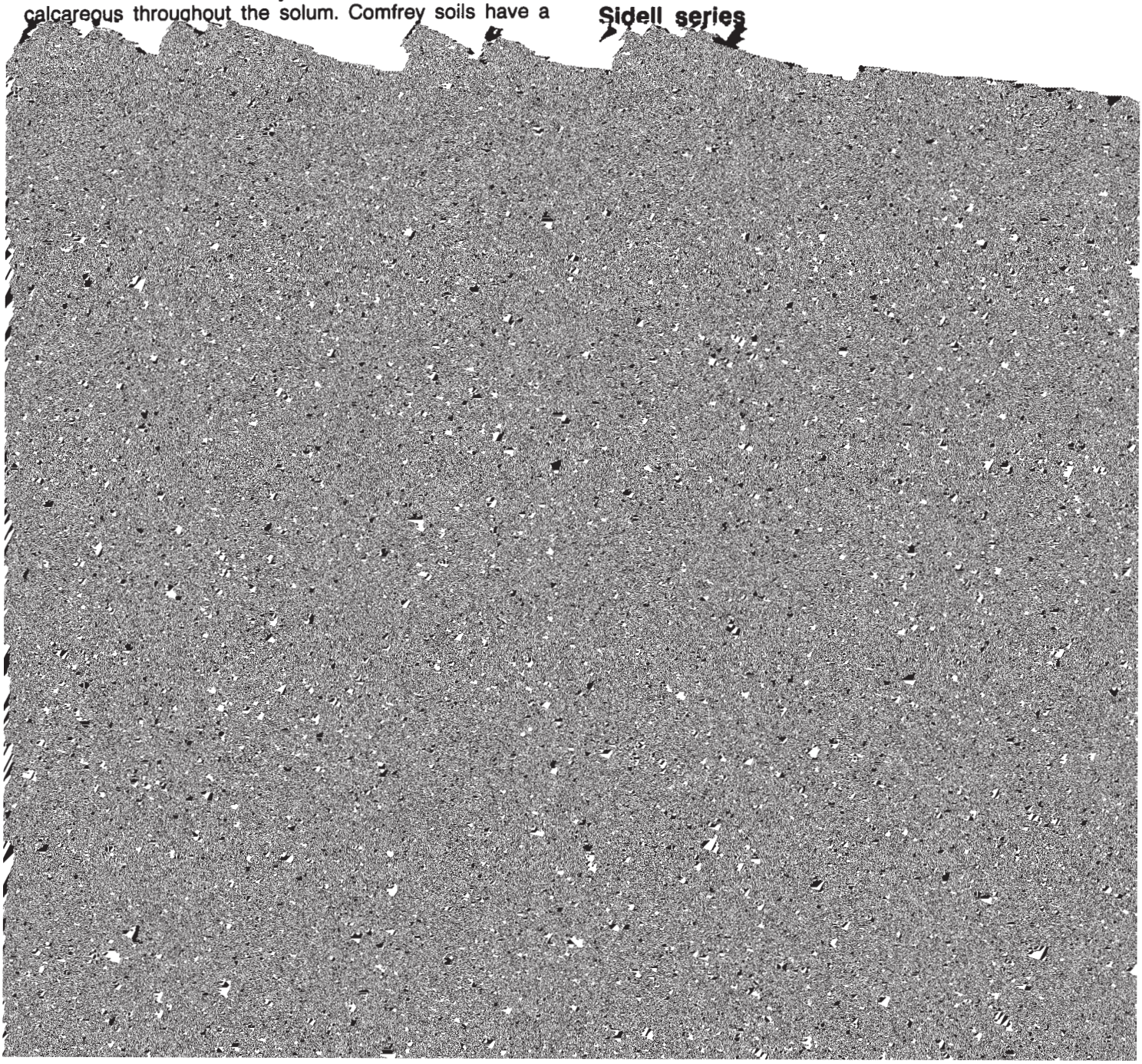
Selma series

This series consists of poorly drained soils that have moderate permeability in the subsoil and moderate or moderately rapid permeability in the substratum. These soils formed in loamy outwash on stream terraces and outwash plains. They formed under reed and sedge vegetation. Slope ranges from 0 to 2 percent.

Selma soils are similar to Drummer soils and are near Canisteo, Comfrey, Elburn, and La Hogue soils. Drummer soils have a fine and silty solum. Canisteo soils are calcareous throughout the solum. Comfrey soils have a surface layer ranges from 12 to 23 inches in thickness, and in some pedons, it extends into the B horizon.

The A horizon has color value of 2 or 3 and chroma of 1 or 2. It typically is loam, silt loam, silty clay loam, or clay loam. The B horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 1 or 2. It is dominantly clay loam or loam but is sandy clay loam or sandy loam in places. The C horizon is stratified sand, loamy sand, loam, silt loam, and sand loam and occasionally some gravel.

Sidell series

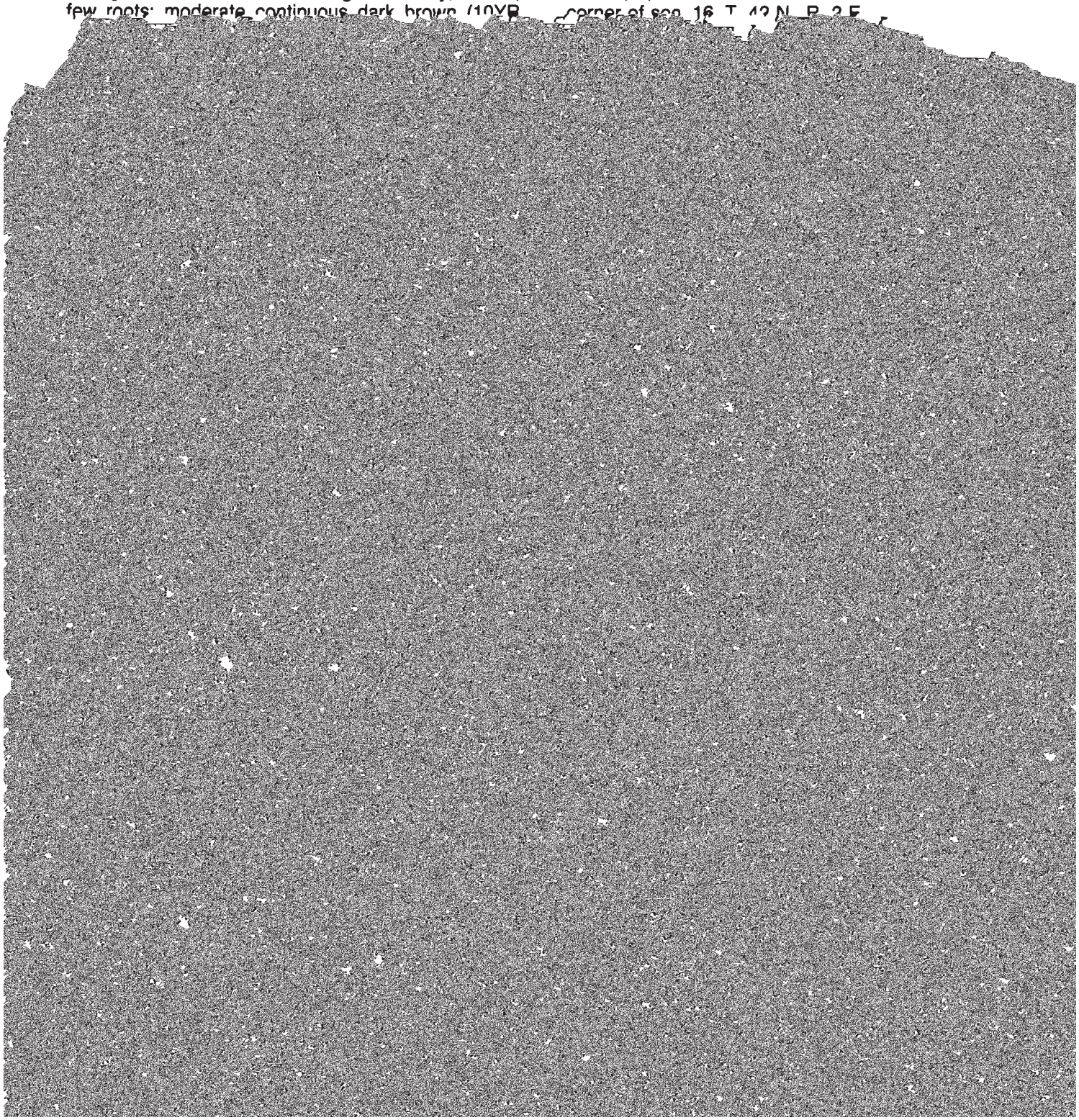


(10YR 7/1) uncoated silt grains on faces of peds; medium acid; clear smooth boundary.

IIB23t—28 to 34 inches; yellowish brown (10YR 5/4) loam; weak medium prismatic structure parting to strong fine and medium subangular blocky; friable; few roots; moderate continuous dark brown (10YR

as the range of the series. These differences do not alter the use or behavior of this soil.

Typical pedon from an area of Sogn loam, 7 to 15 percent slopes, about 1 1/2 miles north of Monroe Center, 1,809 feet south and 643 feet west of northeast corner of sec. 16, T. 42 N., R. 2 E.



organic films on some sand grains; strongly acid; clear smooth boundary.

B22—24 to 31 inches; brown (7.5YR 5/4) sand; weak medium and coarse subangular blocky structure; very friable; few roots; medium acid; clear smooth boundary.

C—31 to 60 inches; reddish yellow (7.5YR 6/6) sand; single grained; loose; medium acid.

The solum ranges from 24 to about 40 inches in thickness.

The dark colored A horizon ranges from 10 to 24 inches in thickness. The A1 horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2. It is loamy sand, loamy fine sand, or sand. The B horizon has hue of 10YR or 7.5YR and value and chroma of 4, 5, or 6. It is sand, fine sand, loamy sand, or loamy fine sand.

St. Charles series

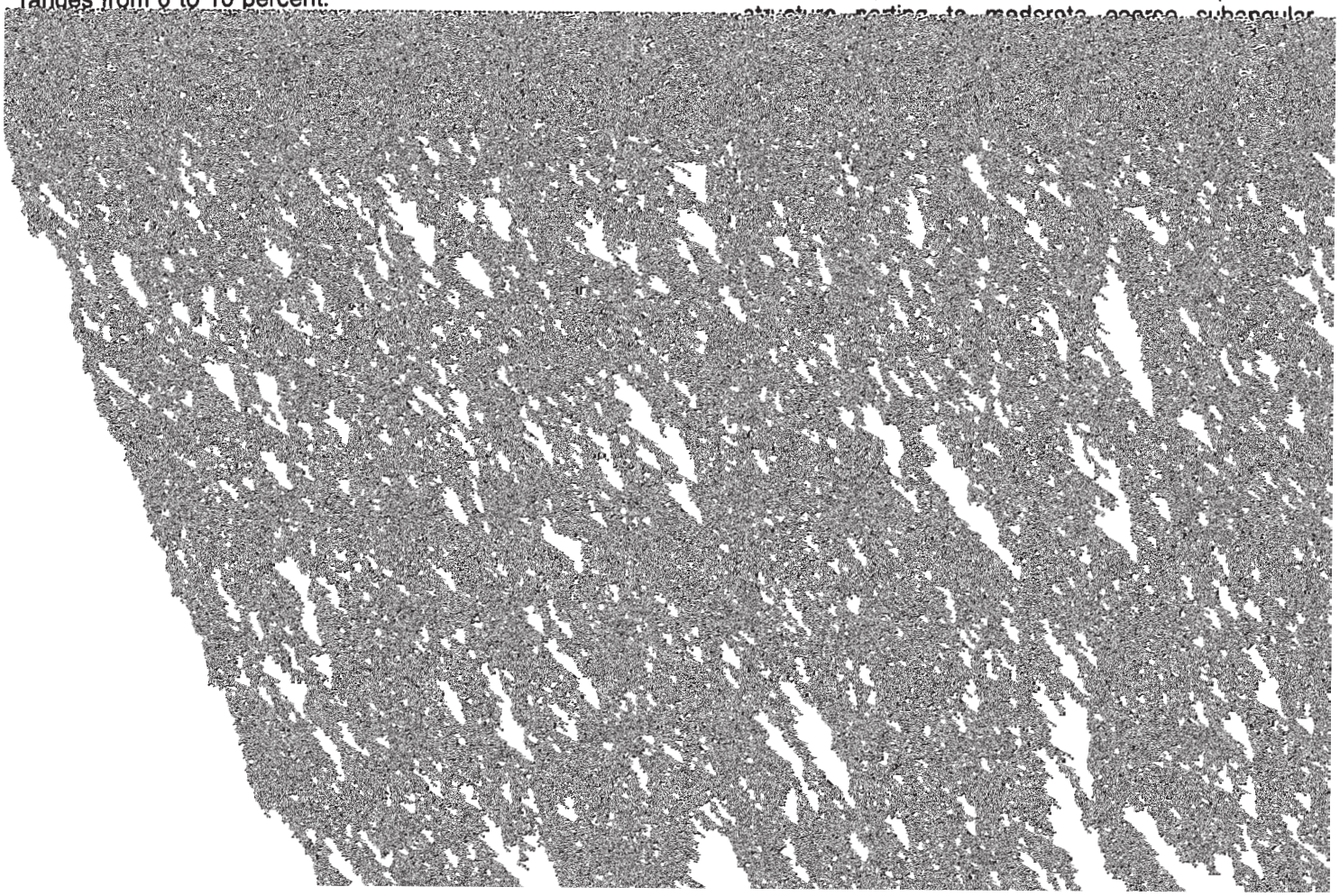
This series consists of moderately well drained soils that have moderate permeability. These soils formed in 40 to 60 inches of loess and moderately coarse textured glacial outwash or till. They formed under forest vegetation on stream terraces and outwash plains. Slope ranges from 0 to 10 percent.

strong fine and medium subangular blocky; firm; common roots; moderate continuous yellowish brown (10YR 5/4) clay films and light gray (10YR 7/1) uncoated silt grains on faces of peds; strongly acid; clear smooth boundary.

B22t—24 to 29 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium prismatic structure parting to strong fine and medium subangular blocky; firm; few roots; moderate discontinuous yellowish brown (10YR 5/4) clay films, moderate patchy dark brown (7.5YR 4/4) clay films, and light gray (10YR 7/1) uncoated silt grains on faces of peds; strongly acid; clear smooth boundary.

B23t—29 to 38 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium and coarse prismatic structure parting to strong medium subangular blocky; firm; few roots; moderate discontinous dark brown (7.5YR 4/4) clay films, patchy yellowish brown (10YR 5/4) clay films, and light gray (10YR 7/1) uncoated silt grains on faces of peds; strongly acid; clear smooth boundary.

B24t—38 to 46 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct strong brown (7.5YR 5/6) mottles; moderate coarse prismatic structure parting to moderate coarse subangular



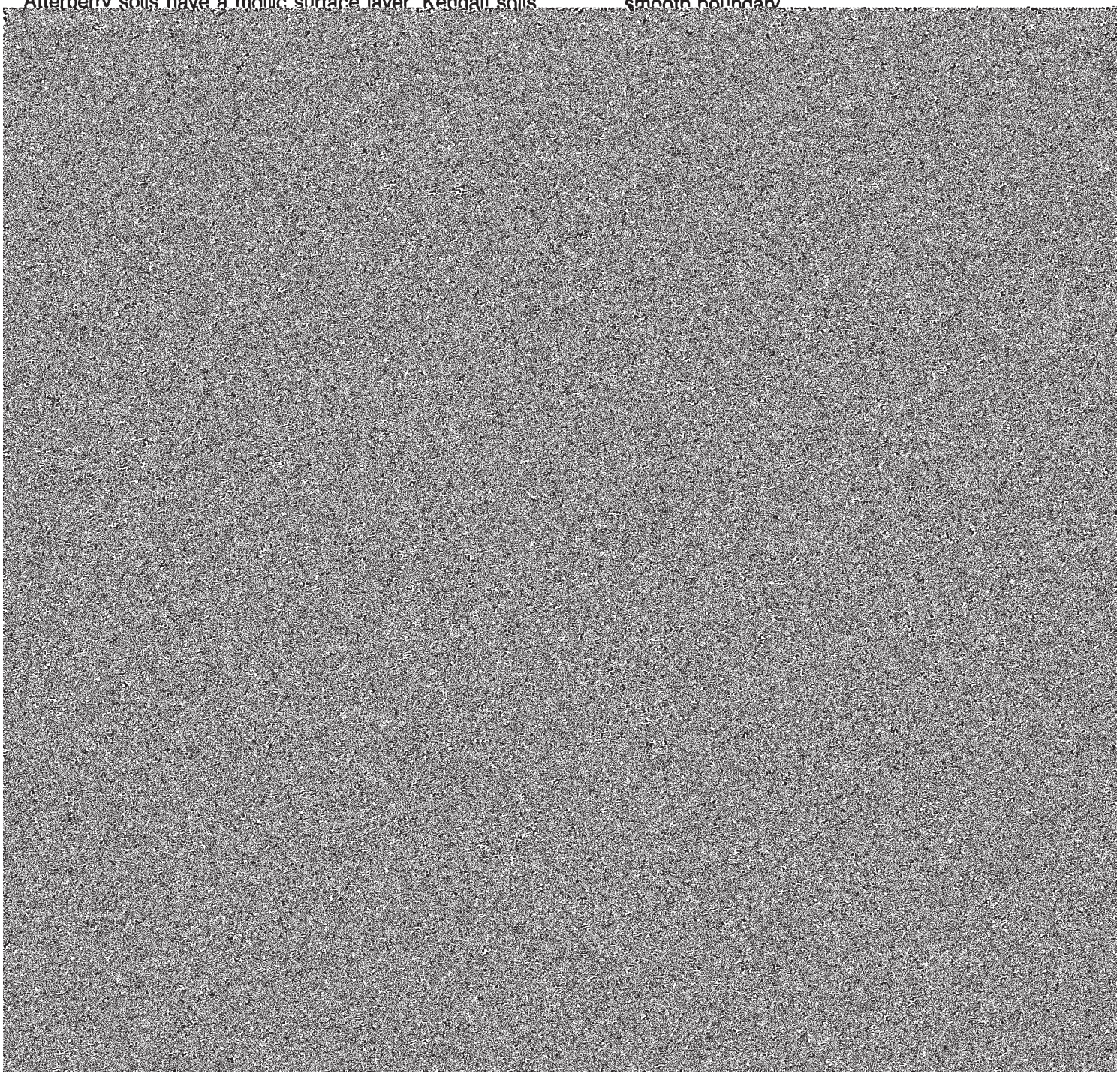
Stronghurst series

This series consists of somewhat poorly drained soils that have moderate or moderately slow permeability. These soils formed in loess. They formed under forest vegetation on uplands and terraces. Slope ranges from 0 to 3 percent.

Stronghurst soils are similar to Atterberry and Kendall soils and are near Fayette, Flagg, and Rozetta soils. Atterberry soils have a mollic surface layer. Kendall soils

concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

B23t—34 to 44 inches; mottled grayish brown (2.5Y 5/2) yellowish brown (10YR 5/6) and light olive brown (2.5Y 5/4) silty clay loam; moderate coarse prismatic structure; friable; few roots; moderate dark grayish brown (2.5Y 4/2) discontinuous clay films on faces of peds; many medium and coarse dark concretions (iron and manganese oxides); medium acid; clear smooth boundary.



medium granular structure; friable; common roots; layer compacted because of tillage; neutral; abrupt smooth boundary.

A3—10 to 17 inches; very dark grayish brown (10YR 3/2) with some dark brown (10YR 3/3 and 4/3) loam, grayish brown (10YR 5/2) dry; loamy, weak medium subangular blocky structure parting to strong very fine and fine granular; friable; common roots; neutral; clear smooth boundary.

B21t—17 to 25 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak coarse subangular blocky structure; friable; few roots; thin continuous dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

B22t—25 to 35 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few roots; thin discontinuous dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

B23t—35 to 47 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to strong medium subangular blocky; friable; few roots; thin discontinuous dark brown (10YR 4/3) clay films and light gray (10YR 7/1) uncoated silt grains on faces of peds; medium acid; abrupt smooth boundary.

IIB3t—47 to 53 inches; yellowish brown (10YR 5/4) clay loam; moderate coarse prismatic structure; firm; moderately thick continuous brown (10YR 5/3) clay films on vertical faces of peds; few small pebbles; mildly alkaline; clear smooth boundary.

IIC—53 to 60 inches; light yellowish brown (10YR 6/4) clay loam; common fine distinct yellowish brown (10YR 5/6) and few fine prominent strong brown

Tama soils are similar to and are near Ashdale, Catlin, Downs, Muscatine, and Ogle soils. Ashdale soils formed in thinner loess, and limestone bedrock is at depth of 40 to 60 inches. Downs soils have a thinner A horizon and have an A2 horizon. Muscatine soils have poorer natural drainage. Catlin and Ogle soils formed in thinner loess, and glacial drift is at a depth of 40 to 60 inches.

Typical pedon from an area of Tama silt loam, 2 to 5 percent slopes, on an upland ridge about 4 miles west of Polo, 558 feet north and 52 feet east of southwest corner of sec. 14, T. 23 N., R. 7 E.

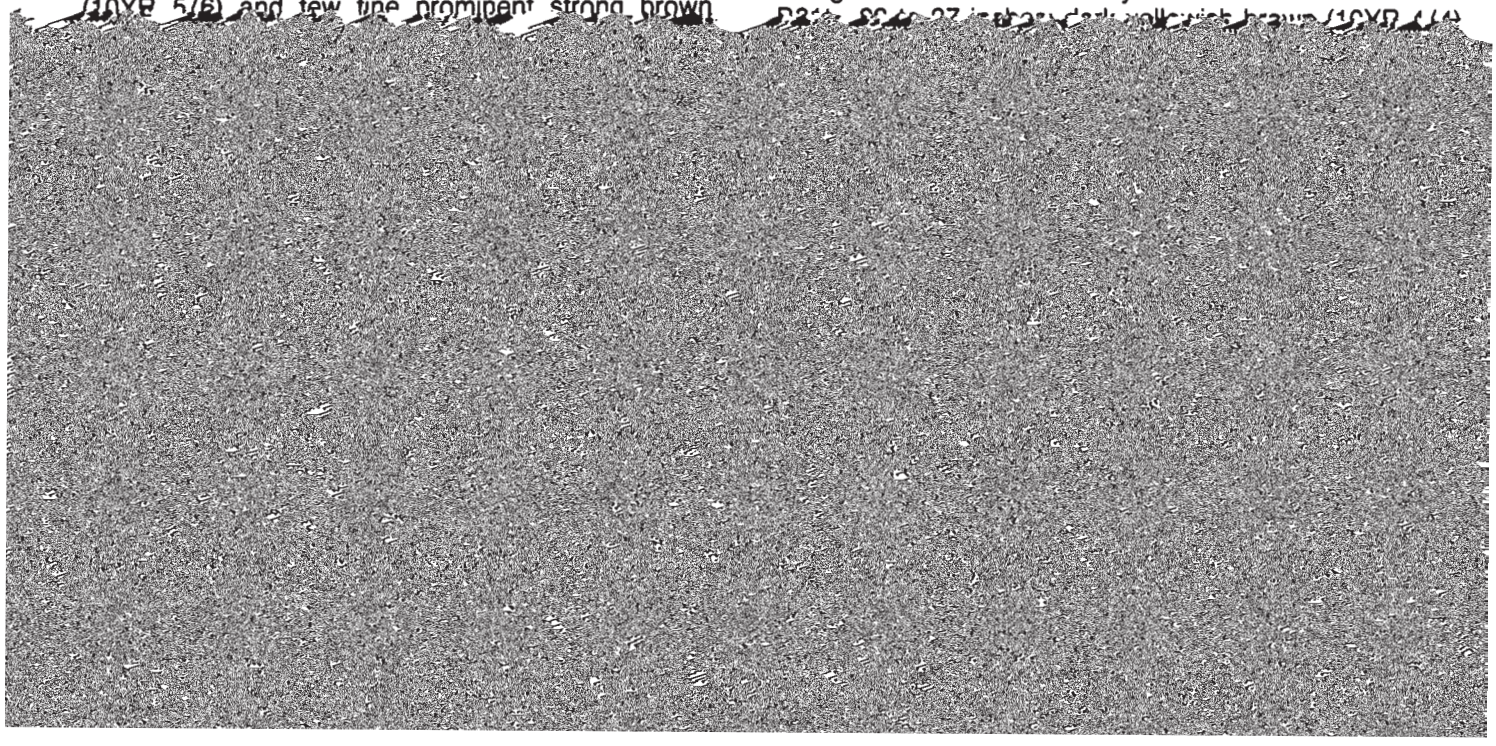
Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common roots; layer compacted because of agricultural practices; neutral; abrupt smooth boundary.

A12—7 to 12 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium structure; friable; few roots; weak plates as a result of compaction; neutral; clear smooth boundary.

A13—12 to 17 inches; very dark grayish brown (10YR 3/2) mixed with some dark yellowish brown (10YR 4/4) silt loam, grayish brown (10YR 5/2) dry; weak very coarse granular structure parting to moderate fine and medium granular; friable; few roots; neutral; clear smooth boundary.

B1t—17 to 23 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak coarse subangular blocky structure parting to moderate fine and medium subangular blocky; friable; few roots; thin continuous dark yellowish brown (10YR 3/4) clay films and uncoated silt grains on faces of peds; medium acid; gradual smooth boundary.

B2[illegible] 23 to 27 inches; dark yellowish brown (10YR 4/4)



The solum ranges from 40 to 60 inches or more in thickness.

The A1 or Ap horizon is black (10YR 2/1) or very dark brown (10YR 2/2), but the Ap horizon of some eroded soils ranges to very dark grayish brown (10YR 3/2). Mottles are evident in the lower part of the B horizon in some pedons.

In map unit 36C2, the surface layer is thinner than is defined as the range for the series, but this difference does not alter the use or behavior of the soil.

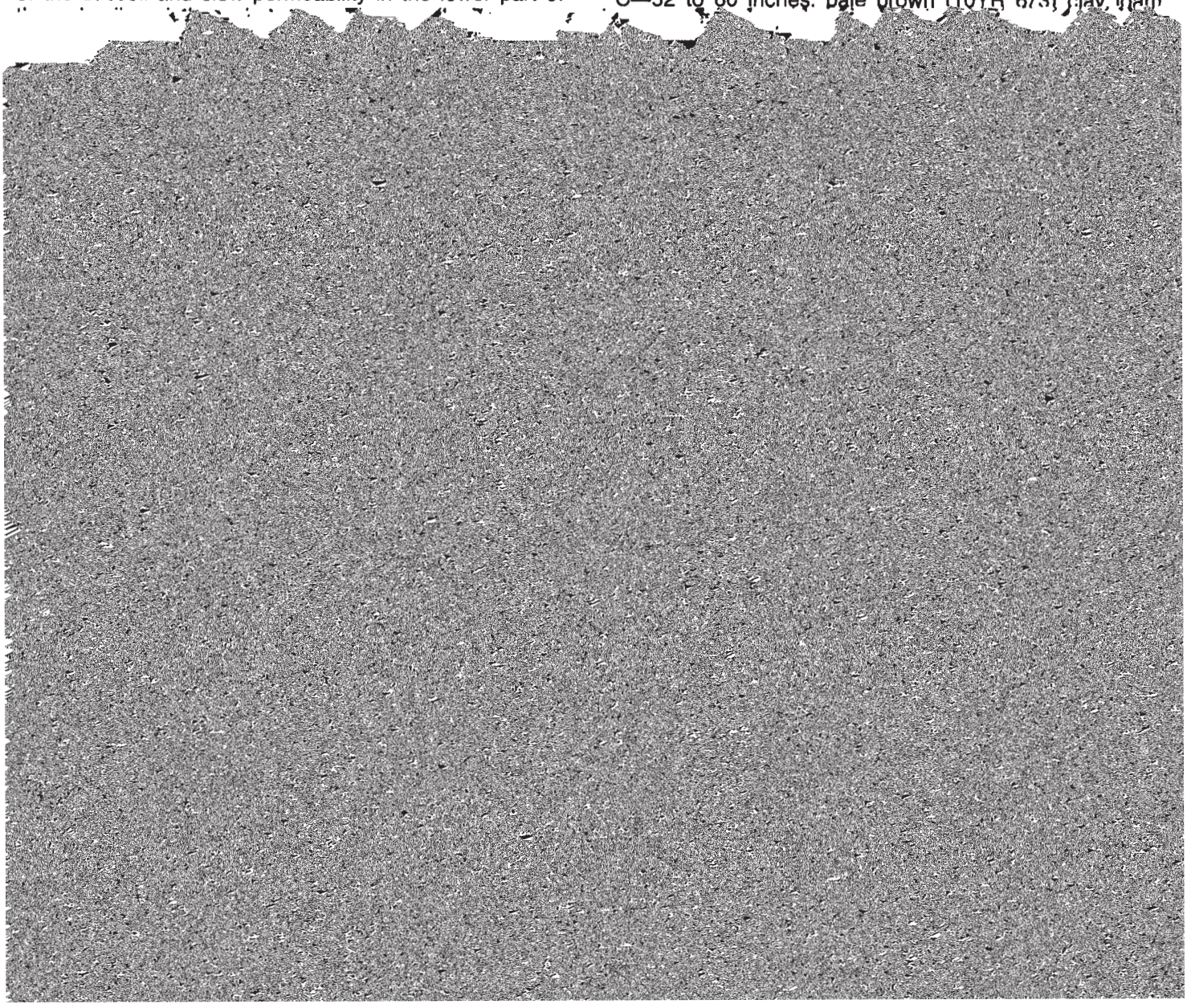
Varna series

This series consists of moderately well drained soils that have moderately slow permeability in the upper part of the subsoil and slow permeability in the lower part of

B24t—32 to 40 inches; brown (10YR 5/3) silty clay; strong medium prismatic structure; firm; few roots; thin discontinuous grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) clay films on faces of peds; few pebbles; common soft calcium carbonate accumulations; strong effervescence; moderately alkaline; clear smooth boundary.

B3t—40 to 52 inches; brown (10YR 5/3) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; few roots; thin patchy grayish brown (10YR 5/2) clay films on faces of peds; common soft calcium carbonate accumulations; 1 percent pebbles; strong effervescence; moderately alkaline; gradual smooth boundary.

C—52 to 60 inches; pale brown (10YR 6/3) clay loam;



A12—6 to 11 inches; mixed very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; moderate very fine and fine granular structure; friable; common roots;

Waukee series

This series consists of well drained soils that have moderate permeability in the subsoil and very rapid permeability in the underlying material. These soils formed

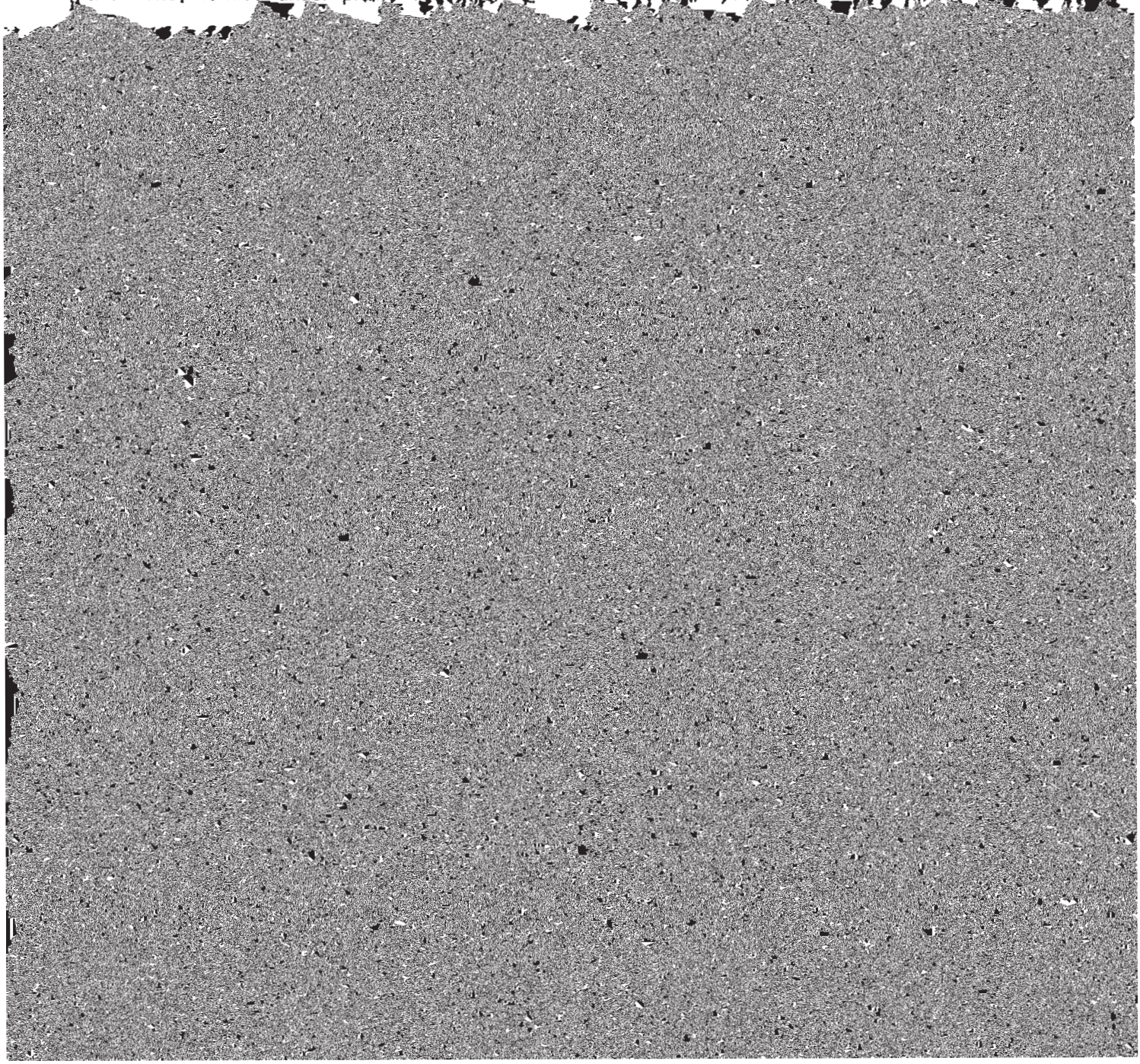
some pedons. The C horizon contains some gravel, and some strata are as much as 20 to 50 percent gravel, by volume.

Wea series

This series consists of well drained soils that have moderate permeability in the solum and very rapid permeability in the substratum. These soils formed in a thin layer of loess and loamy drift overlying calcareous sand and gravel. They formed under prairie vegetation on

The solum thickness ranges from 40 inches to as much as 70 inches and typically is the same as the depth to sand and gravel.

The A horizon has color value of 2 or 3 and chroma of 1 or 2. It is silt loam to loam. The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 through 6. In some pedons, mottles are at a depth of more than 36 inches. The Bt horizon commonly is clay loam; individual horizons of silt loam or silty clay loam are in the upper part of the Bt horizon of some pedons, and gravel-

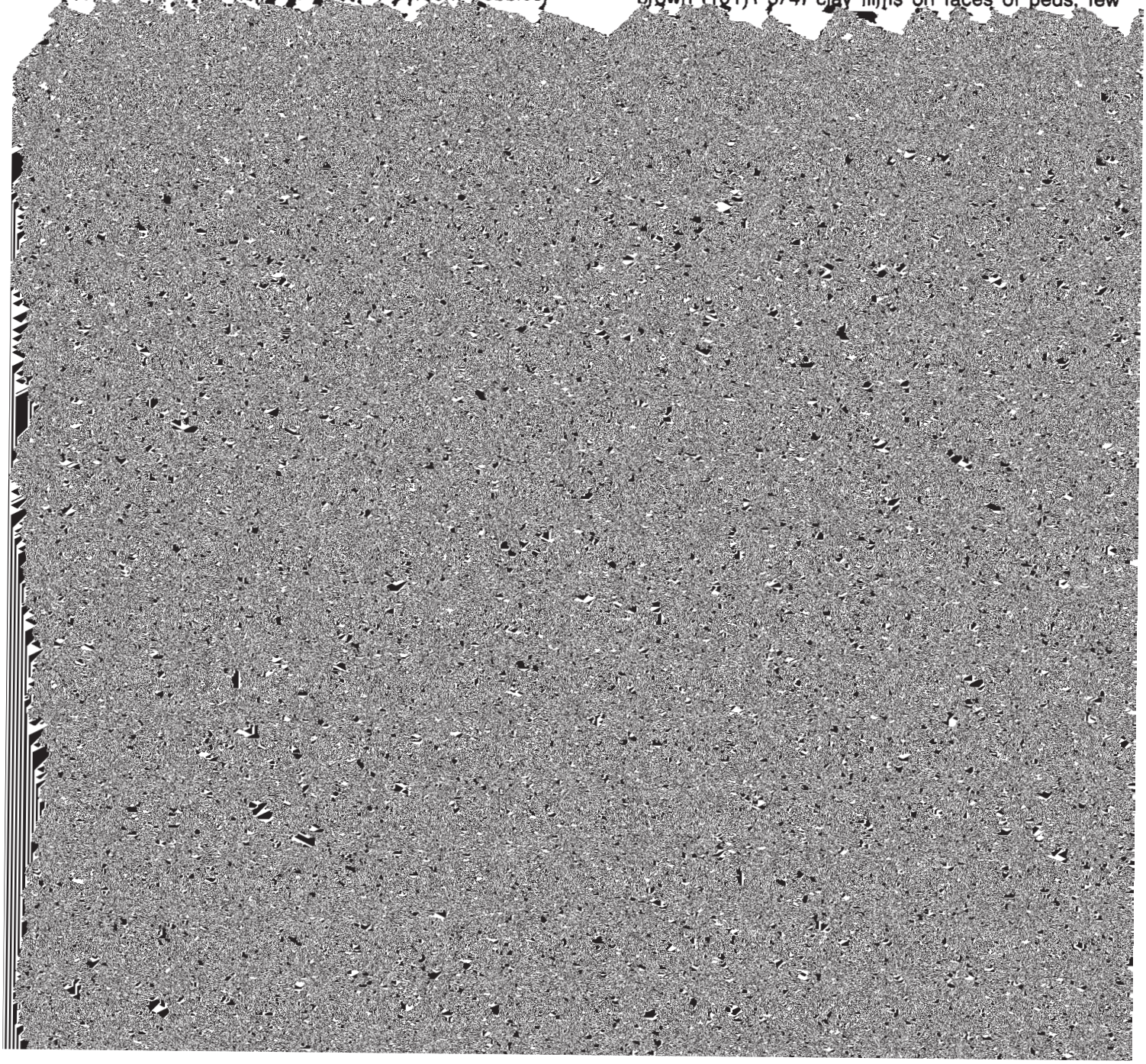


to moderate fine and medium subangular blocky; friable; common roots; moderate continuous dark reddish brown (5YR 3/4) clay films on faces of peds; 9 percent pebbles; few black (5YR 2/1) organic films on faces of peds in lower part of horizon; strongly acid; clear smooth boundary.

IIB23t—22 to 29 inches; yellowish red (5YR 4/6) sandy clay loam; weak coarse prismatic structure; friable; few roots; thin continuous dark reddish brown (5YR 3/4) clay films and thin patchy black (5YR 2/1) organic films on faces of peds; 4 percent pebbles;

B21t—7 to 14 inches; dark brown (10YR 4/3) clay loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; common roots; thin patchy dark yellowish brown (10YR 3/4) clay films on faces of peds; slightly acid; clear smooth boundary.

B22t—14 to 25 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; friable; common roots; thin discontinuous dark yellowish brown (10YR 3/4) clay films on faces of peds; few



Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam; brown (10YR 5/3) dry; moderate medium and fine granular structure; friable; common roots; some sand particles; slightly acid; abrupt smooth boundary.

B21t—9 to 14 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium prismatic structure; friable; common roots; thin discontinuous dark brown (7.5YR 4/4) clay films on faces of peds; about 10 percent pebbles; medium acid; clear smooth boundary.

B22t—14 to 19 inches; yellowish red (5YR 4/6) gravel in clay loam; weak coarse subangular blocky structure; friable; common roots; thin patchy reddish brown (5YR 4/4) clay films on faces of peds; stone line; some pebbles 1 inch to 3 inches in diameter; 25 to 30 percent pebbles; medium acid; abrupt wavy boundary.

B23t—19 to 27 inches; red (2.5YR 4/6) clay loam; weak fine prismatic structure parting to weak medium subangular blocky; friable; common roots; thin discontinuous dark red (2.5YR 3/6) clay films on faces of peds; about 10 percent pebbles; strongly acid; clear wavy boundary.

B24t—27 to 41 inches; red (2.5YR 4/6) gravelly clay loam; weak medium prismatic structure parting to

Woodbine series

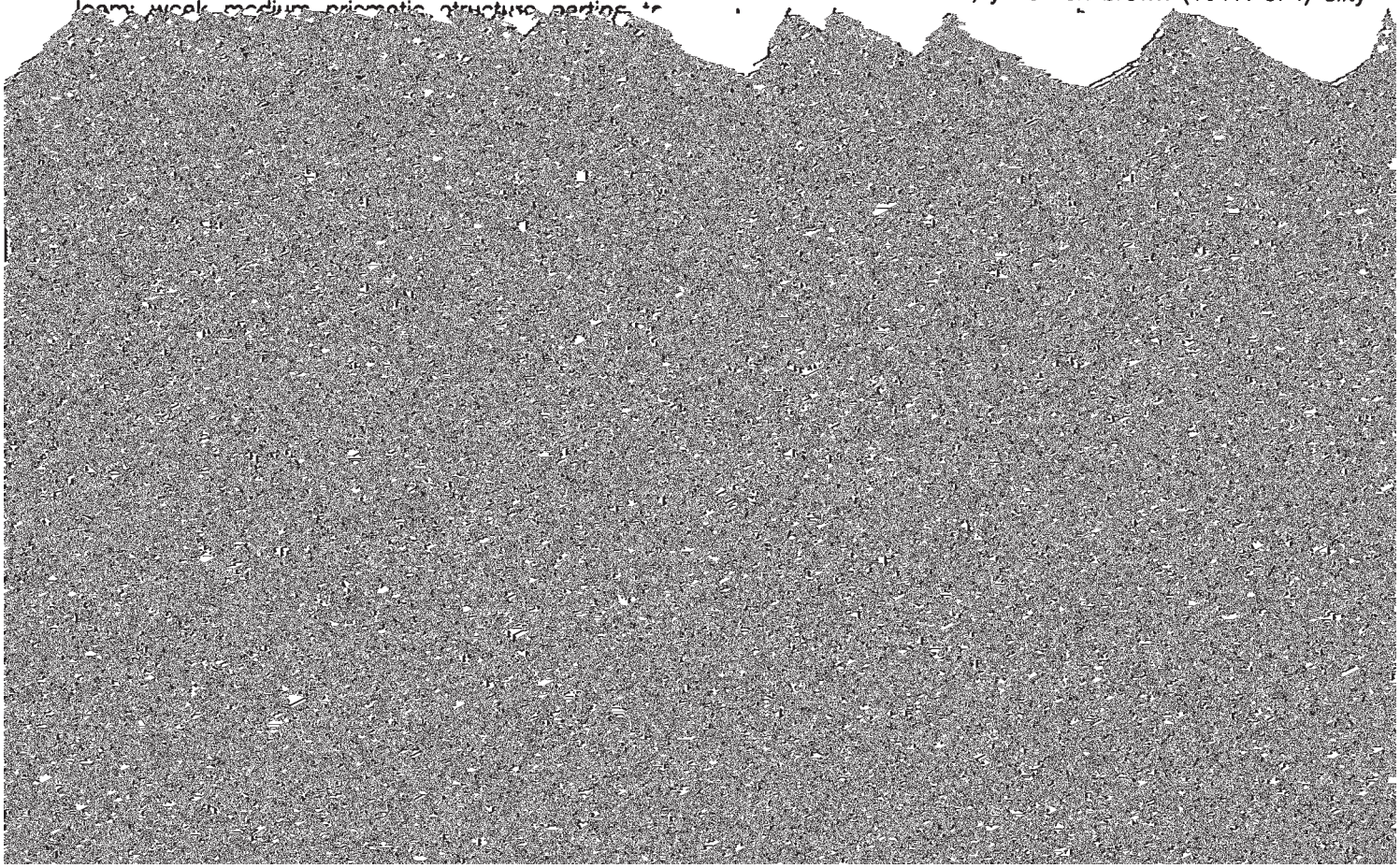
This series consists of well drained soils that have moderate permeability in the upper part of the subsoil and slow permeability in the lower part of the subsoil. These soils formed in loess and glacial drift and in residuum from limestone bedrock. They formed under forest vegetation on uplands. Slope ranges from 2 to 10 percent.

Woodbine soils are similar to and are near Fayette, Martinsville, St. Charles, and Whalan soils. Fayette, Martinsville, and St. Charles soils do not have limestone bedrock within a depth of 60 inches. In Whalan soils, the solum is terminated by limestone bedrock within 40 inches of the surface.

Typical pedon from an area of Woodbine silt loam, 5 to 10 percent slopes, eroded, on a side slope about 1 mile southwest of Payne's Point, 4,620 feet north and 1,042 feet west of southeast corner of sec. 4, T. 23 N., R. 10 E.

Ap—0 to 5 inches; brown (10YR 5/3) mixed with some yellowish brown (10YR 5/4) silt loam; light yellowish brown (10YR 6/4) dry; moderate fine and medium granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

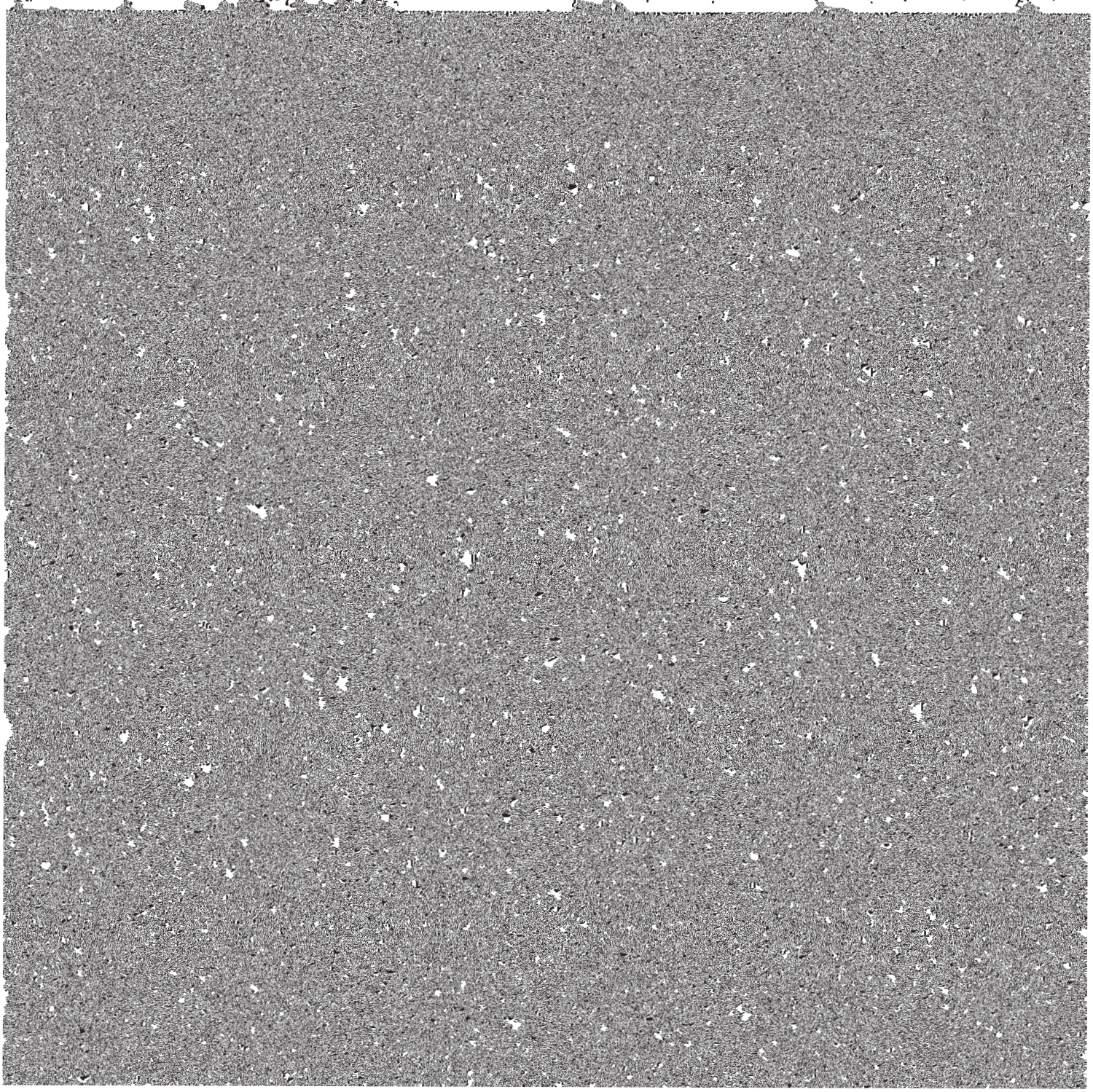
B21t—5 to 12 inches; yellowish brown (10YR 5/4) silty



discontinuous reddish brown (5YR 4/4) clay films on faces of peds; slightly acid; clear wavy boundary.
IIIR—47 inches; brownish yellow (10YR 6/6) limestone bedrock.

The solum commonly is 40 to 50 inches thick, but it ranges to 60 inches in thickness. The limestone bedrock [illegible] 40 to 60 inches.

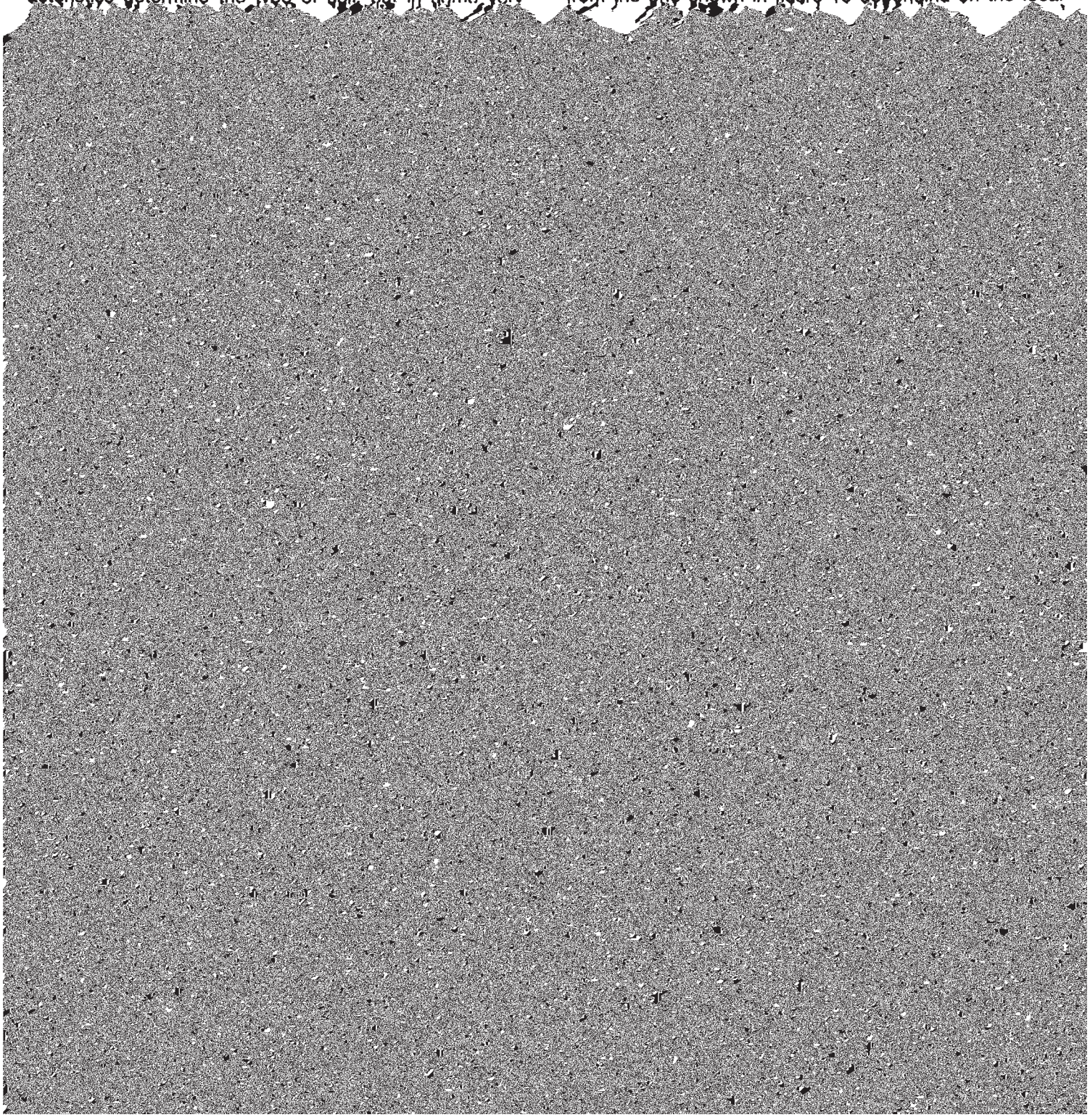
necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that



included as parent material are paleosols, which are ancient soils or previously weathered materials.

The composition of parent materials varies greatly in chemical and mineralogical characteristics which are usually reflected in the soils. In youthful soils these characteristics determine the type of soil, but in some very

upper parent material and the type of underlying material. Because of the wide variety of parent materials and the discontinuous nature of the underlying materials, the groups of soils can occur in numerous patterns. The pattern or sequence of soils across the county can vary from the one shown in figure 13 depending on the local



miles. The Parkland Sand Formation varies from sand to loam in texture. Lamont, Chelsea, and Dickinson soils are commonly formed on thick, sandy deposits. Jasper is an example of a soil formed in thick, loam-textured Parkland sand. Where the depth to dolomite bedrock is less than 5 feet, Atkinson and Whalan soils formed in the more sandy materials, whereas Palsgrove and Ashdale soils formed in loess. The upper part of the dolomite in these soils has weathered to a reddish colored clay. Where the weathered clay had been largely removed by erosion, the Sogn and Rockton soils formed in a thin, loamy material overlying the dolomite bedrock.

The area from the city of Oregon to the southeastern part of the county has been affected by faulting in the bedrock. Millions of years ago, forces within the earth broke up the rock, brought older rocks to the surface, and rearranged the order of the rocks. The faulted area is known as the Sandwich Fault Zone. The St. Peter Sandstone and older sandstone and dolomite formations are exposed in this area. The St. Peter Sandstone is also exposed in the Elkhorn Creek watershed. Eleva and Boone soils formed in sandy surface material over sandstone.

A significant amount of the parent material of the soils in Ogle County was produced by glaciers, which covered all of the county during the Illinoian Glaciation, about 150,000 years ago. Older glacial deposits are in the county, but the distribution is unknown. Younger Wisconsinan deposits are present in eastern Ogle County (*7*) but more recent, unpublished work by the Illinois Geological Survey has shown that the distribution is uncertain.

Most of the glacial deposits in Ogle County are tills, which are mixtures of clay, silt, sand gravel, and a few boulders, that were directly deposited from glaciers. Soils formed in glacial till cover about 18 percent of the county. Many types of till are found in Ogle County ranging from coarse (large amounts of sand and gravel) to fine (large amounts of silt and clay). Griswold and Kidder soils formed in coarse till, which is usually sandy loam in texture. La Rose, Miami, and Parr are examples of soils formed in a medium textured till, which is generally a loam in texture. The Varna soil formed in fine-textured till, which is usually silty clay loam or finer in texture. In many parts of Ogle County, the texture of the upper part of the till varies in texture from silty clay loam or clay loam to loam because of variation within the deposit or because of the outcrop of different till deposits. The cause of the variation is unknown. Many types of soils have formed on the intermediate or loamy deposits in which other soil-forming factors appear to be more and some clay. They generally occur in hills, terraces, and lowlands. Outwash deposits in Ogle County are commonly interbedded with till deposits and generally are discontinuous deposits less than a few square miles in extent. In the county, outwash includes kames, eskers, glacial river and flood deposits, fans, deltas, and lake sediments. These deposits were primarily derived from the sediments carried by glacial meltwater. Typically, outwash grades from coarse textures in the base of the deposit to finer textures at the top. Rodman, Warsaw, and Wea are examples of soils formed in coarse outwash. Jasper, Plano, Drummer, Selma, and Canisteo are typical soils that have formed in the finer-textured outwash. The upper part of these soils contain some sediments that were deposited after the formation of the outwash. Soils formed in glacial outwash cover about 25 percent of the county.

The age of the outwash in Ogle County is of the Illinois or Wisconsin Glaciation. In many places on the uplands, a paleosol is present in the upper part of the Illinoian deposits, which affects the properties of the present soil.

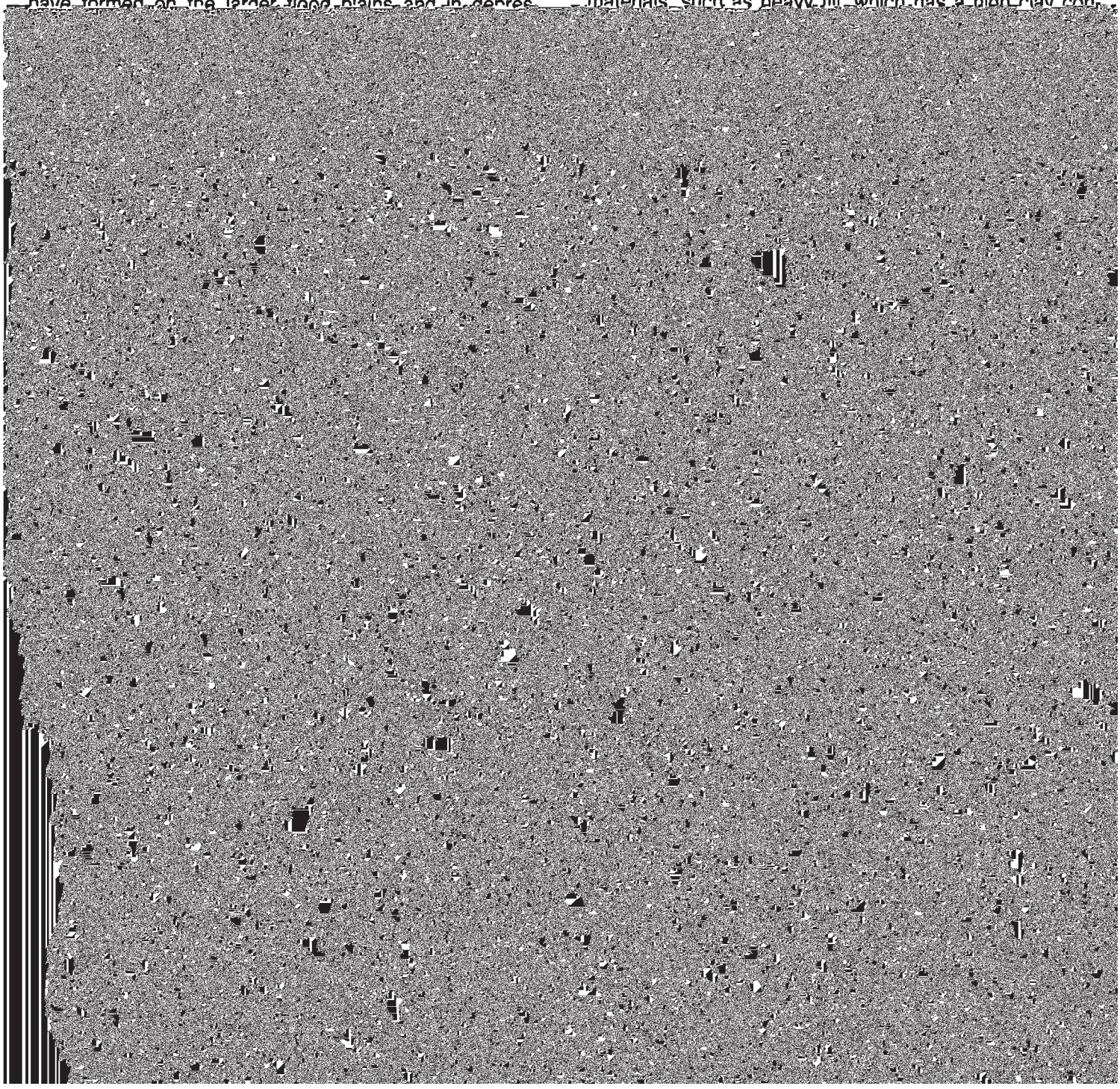
A paleosol in outwash normally causes a reduction in permeability and an increase in water holding capacity when compared to unweathered outwash. The paleosol, however, has been removed by erosion at many localities allowing the underlying, unweathered Illinoian outwash to be exposed to the present soil-forming processes.

Wisconsinan outwash, Henry Formation, does not have a paleosol developed in it. The Henry Formation is confined to the lowlands in eastern Ogle County and the terraces in the Rock River Valley.

Paleosols are common parent materials in Ogle County. About 9 percent of the county contains paleosols that are under the Peoria Loess or the Parkland Sand that is less than five feet thick. Ogle, Myrtle, and Flagg are examples of soils formed in Peoria Loess, 40 to 60 inches thick, overlying a well drained, oxidized paleosol. Pecatonica and Durand soils formed in 20 to 40 inches of Peoria Loess overlying a well drained, oxidized paleosol. Generally confined to the sides or the heads of drainageways, Assumption and Elco soils developed in less than 40 inches of Peoria Loess overlying a gray, deoxidized paleosol. The gray paleosol was once a poorly drained soil that now is in the subsoil of a better drained soil. East of the Rock River Valley, the Parkland Sand covers the bedrock surface and isolated areas of glacial deposits. Westville and similar soils developed through thin, loamy Parkland sand into an oxidized paleosol (not shown on figure 13 because of scale).

figure 13. Lawson and Sawmill soils are found in broader creek and river bottoms. Du Page, a common soil found along the Rock River, formed in loamy alluvium. Alluvium is not shown on figure 13 because of scale. In the Rock River Valley, the alluvium is confined close to the river and is only about 10 to 20 feet thick in most places, whereas the Henry Formation attains a maximum thickness of about 150 feet. Minor amounts of organic soils have formed on the larger flood plains and in depres-

slope. Well drained and moderately well drained soils are on sloping areas, and somewhat poorly or poorly drained soils are on level areas or in depressions. In areas where sandy parent materials are very permeable, well drained soils are on all slopes and level areas, unless there is a permanently high water table. Conversely, poorly drained and somewhat poorly drained soils may be on slopes in areas that have slowly permeable parent materials, such as heavy till which has a high clay con-

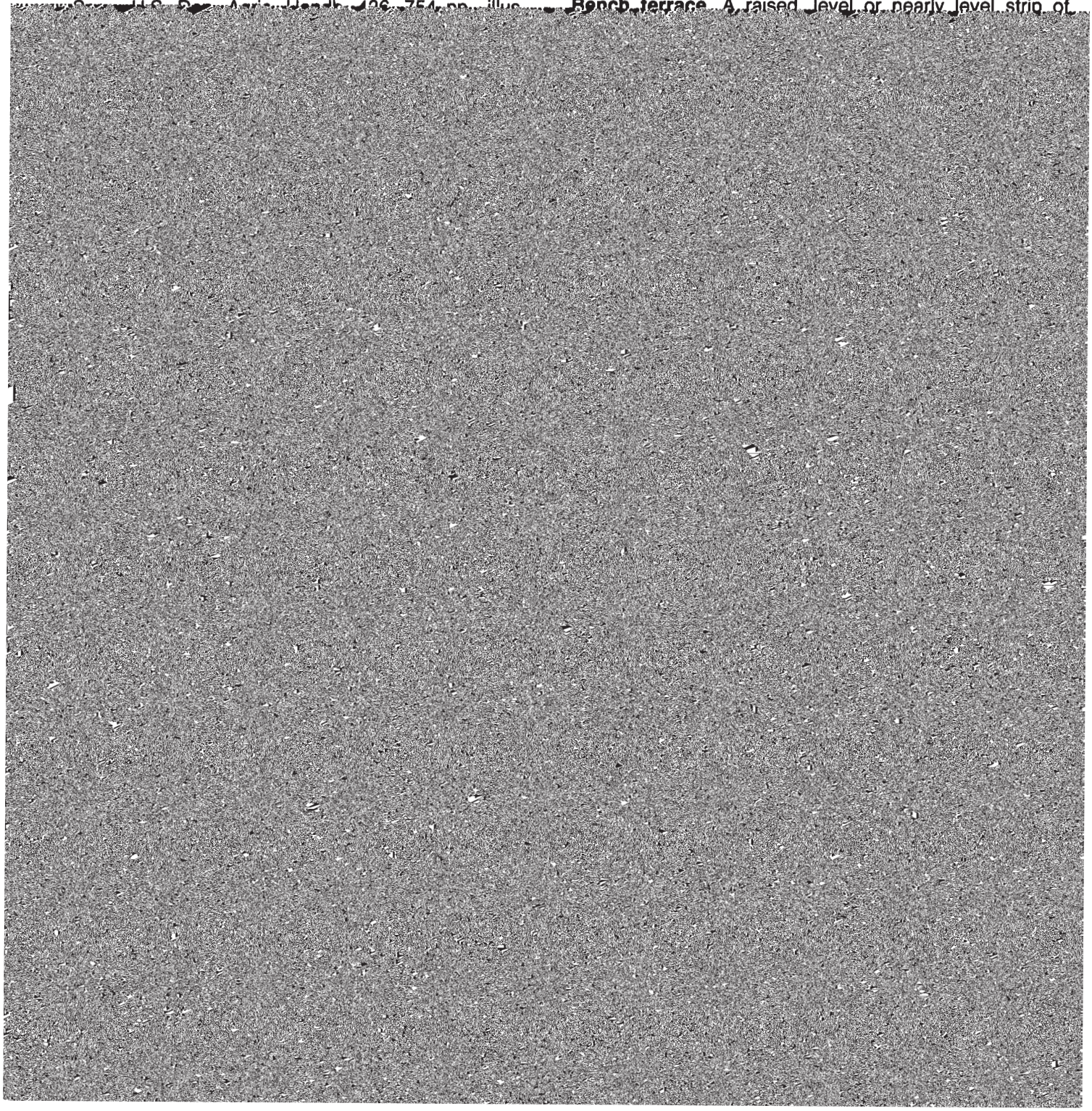


(5) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210, 21 pp.
(6) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv. U.S. Dep. Agric. Handb. 436, 754 pp., illus.

changeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

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

Bench terrace. A raised level or nearly level strip of



Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

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

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). 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 [illegible] inches and [illegible]

regular crop production, or a crop grown between trees and vines in orchards and vineyards.

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

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 periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that [illegible]

layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently

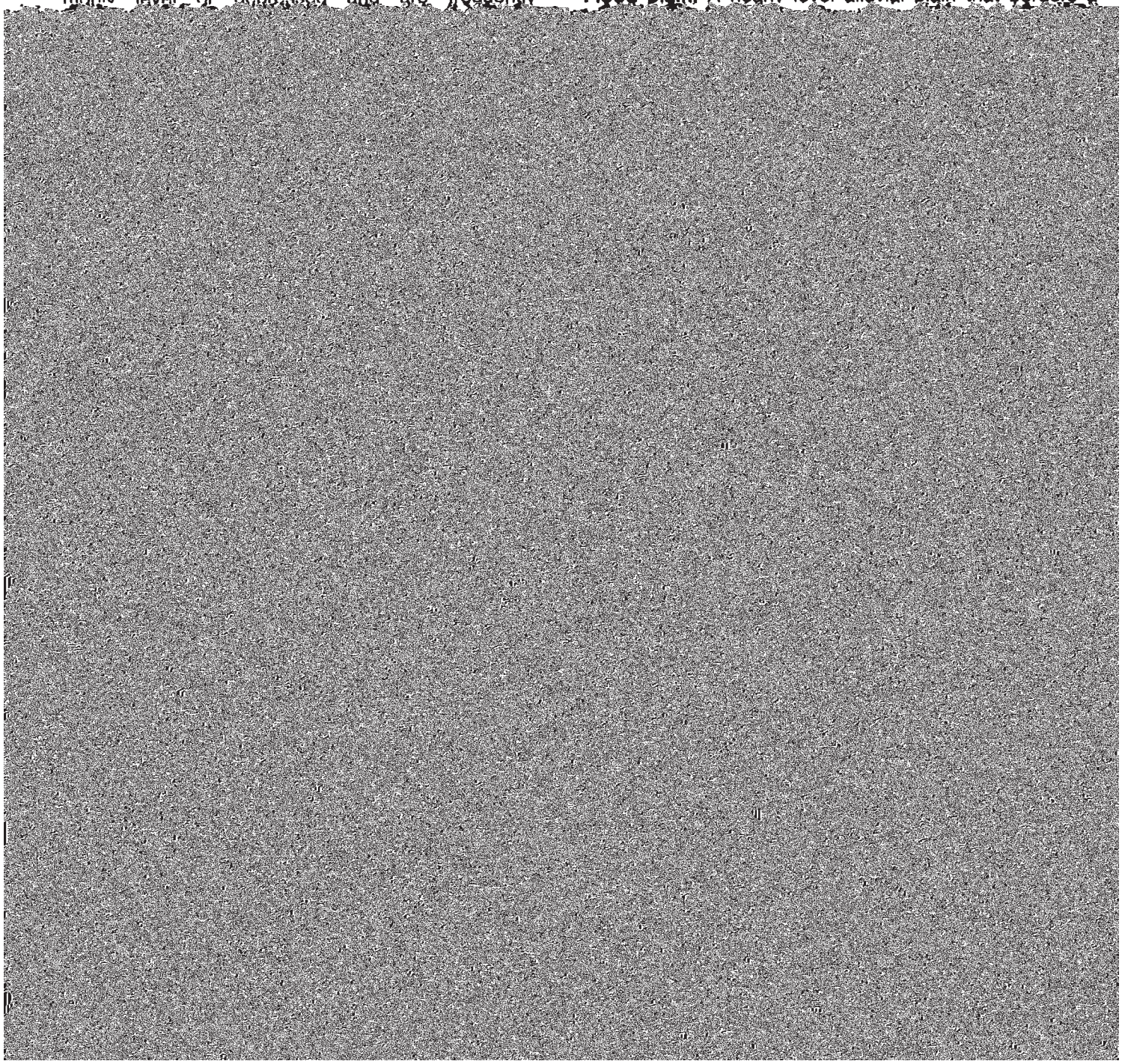
cording to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

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

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

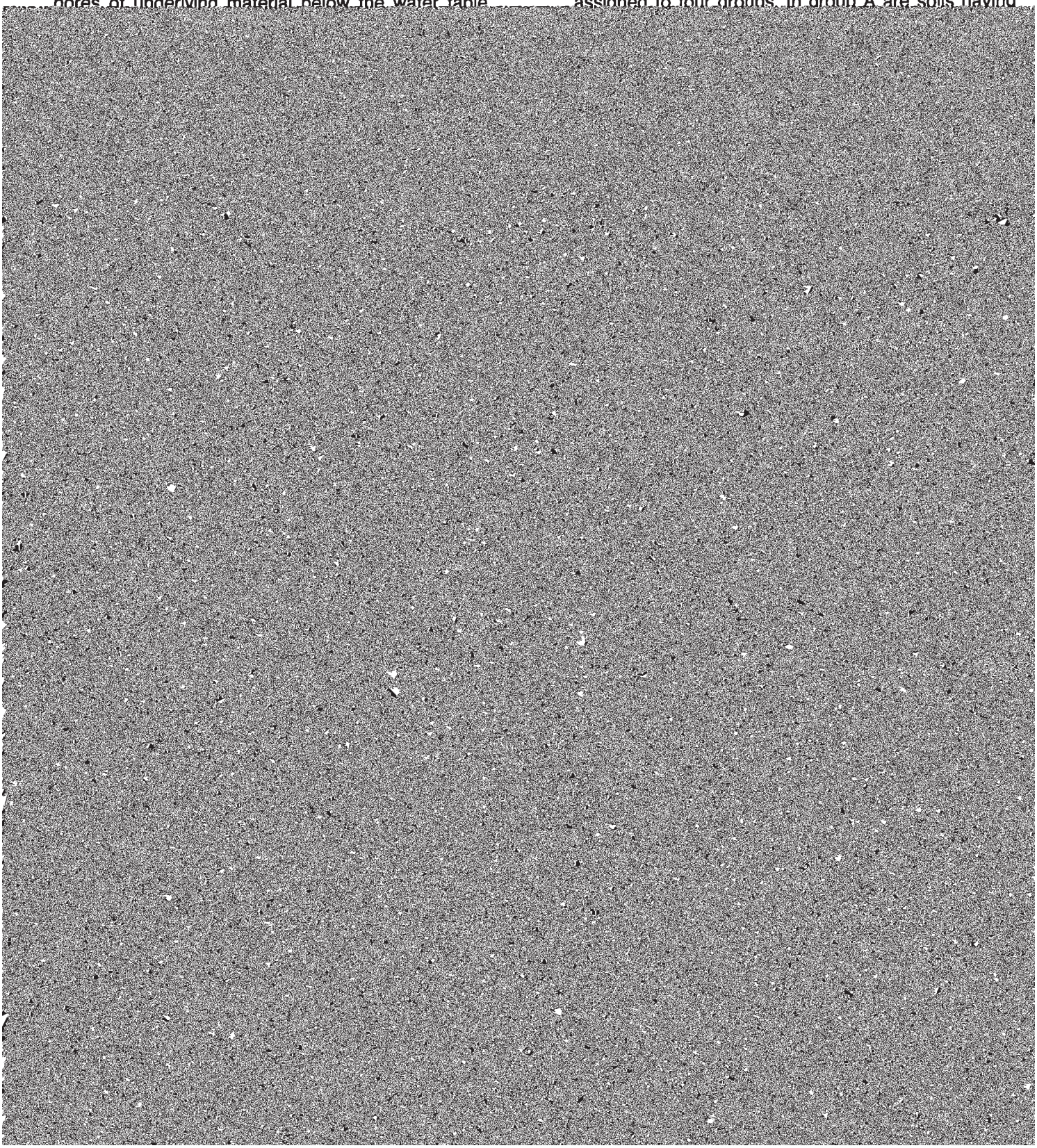
Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 37.5 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a



Ground water (geology). Water filling all the unblocked pores of underlying material below the water table

are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having



Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

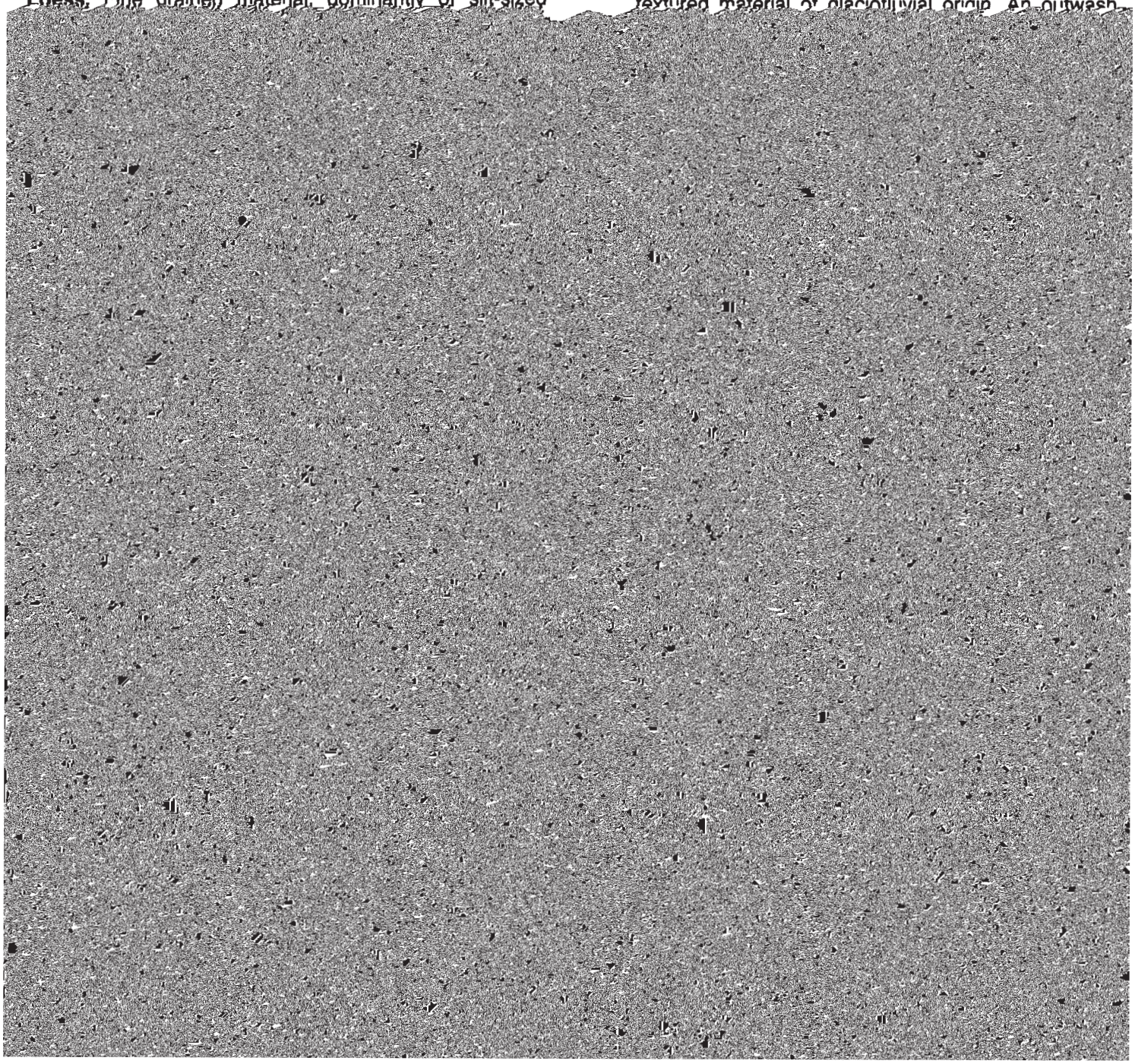
Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized

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.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash



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.

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.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

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

before reaching surface streams is called groundwater runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

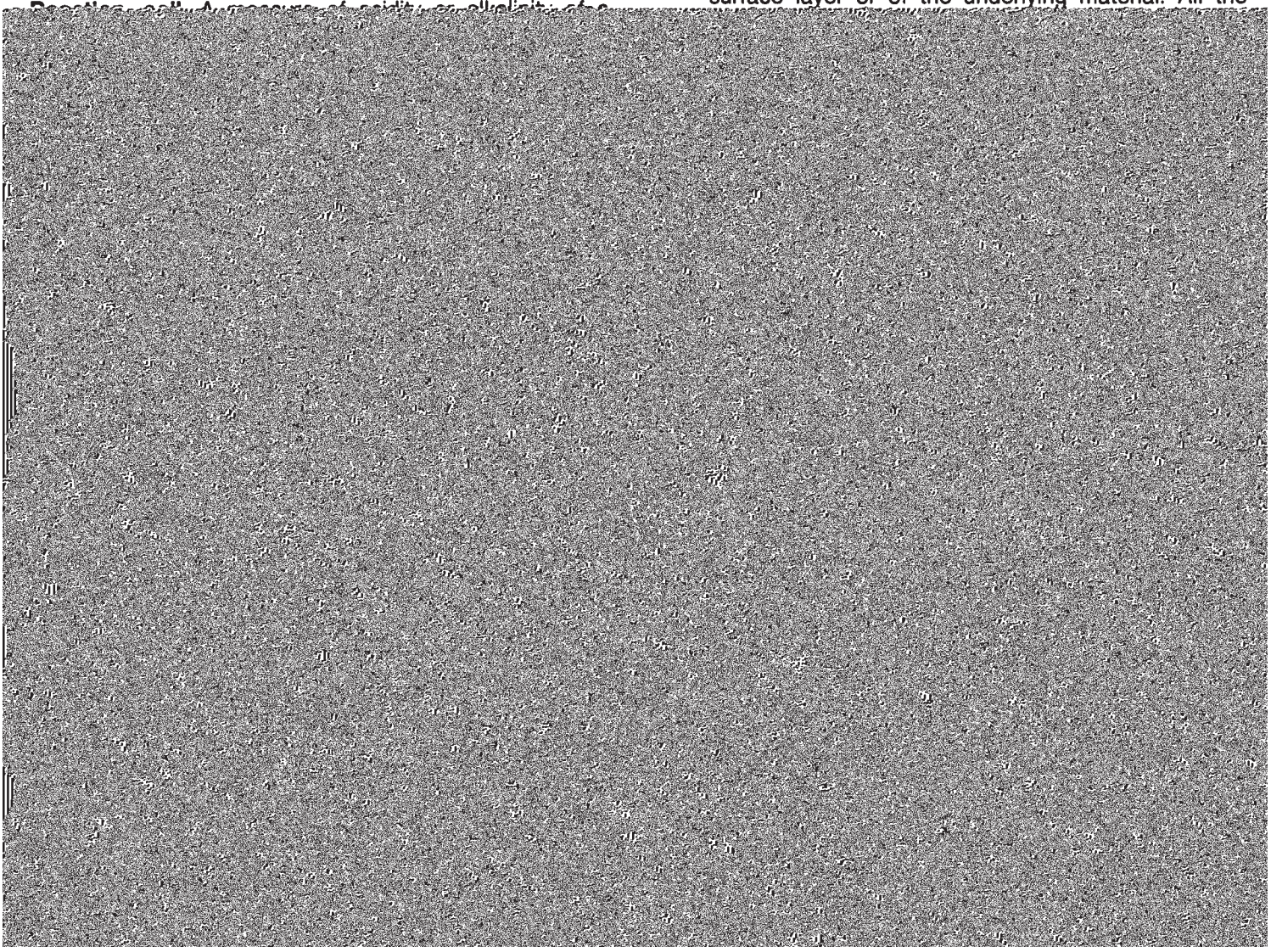
Sandstone. Sedimentary rock containing dominantly sand-size particles.

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

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 or of the underlying material. All the



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 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

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

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

Stone line. A concentration of coarse fragments in a

4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

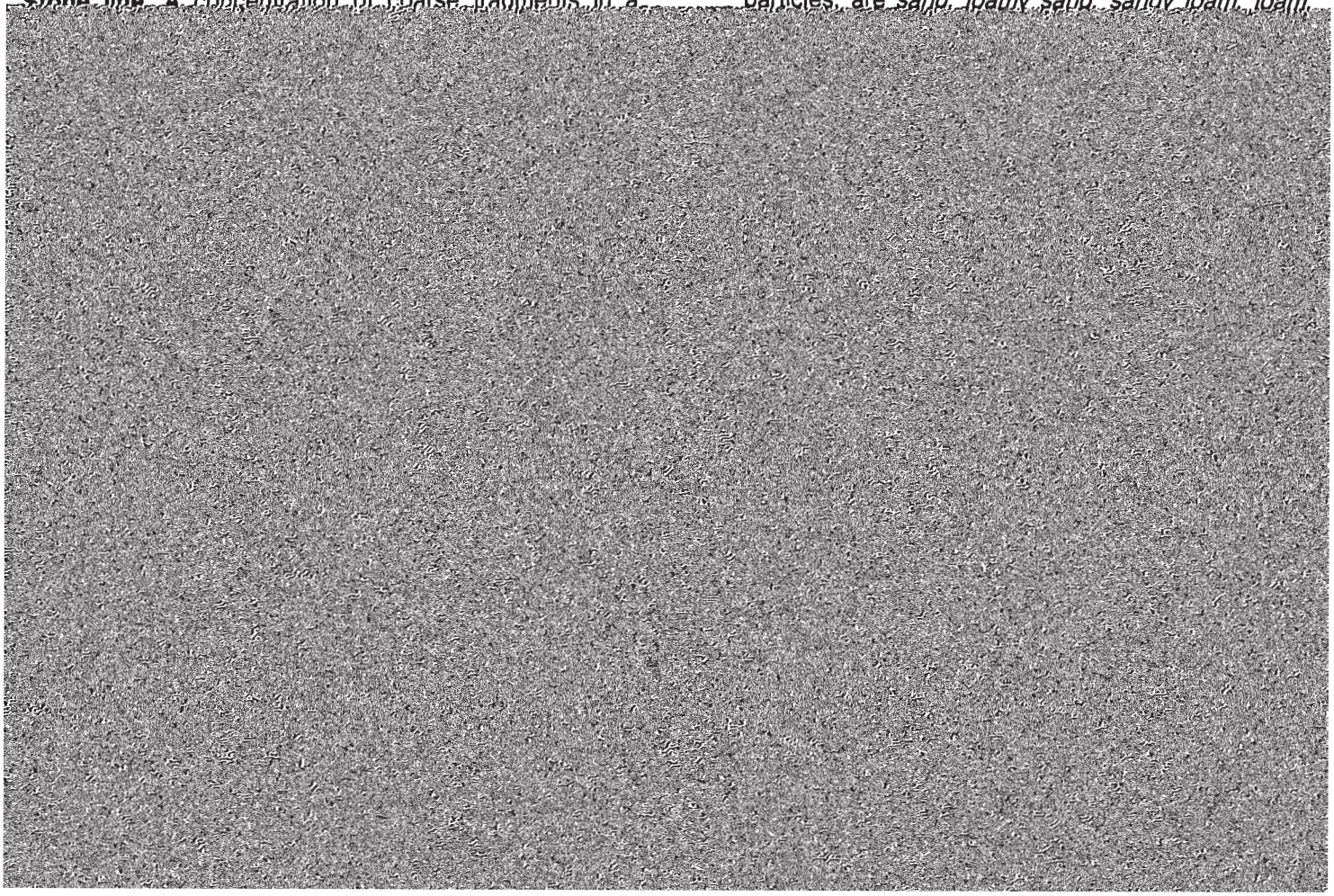
Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

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 it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally 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,*



series name, but occurring in such a limited geographic area that creation of a new series is not justified.

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 sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-75 at Rochelle, Ill.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature	2 years in 10 will have-- Minimum temperature	Average number of growing degree	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch	Average snowfall

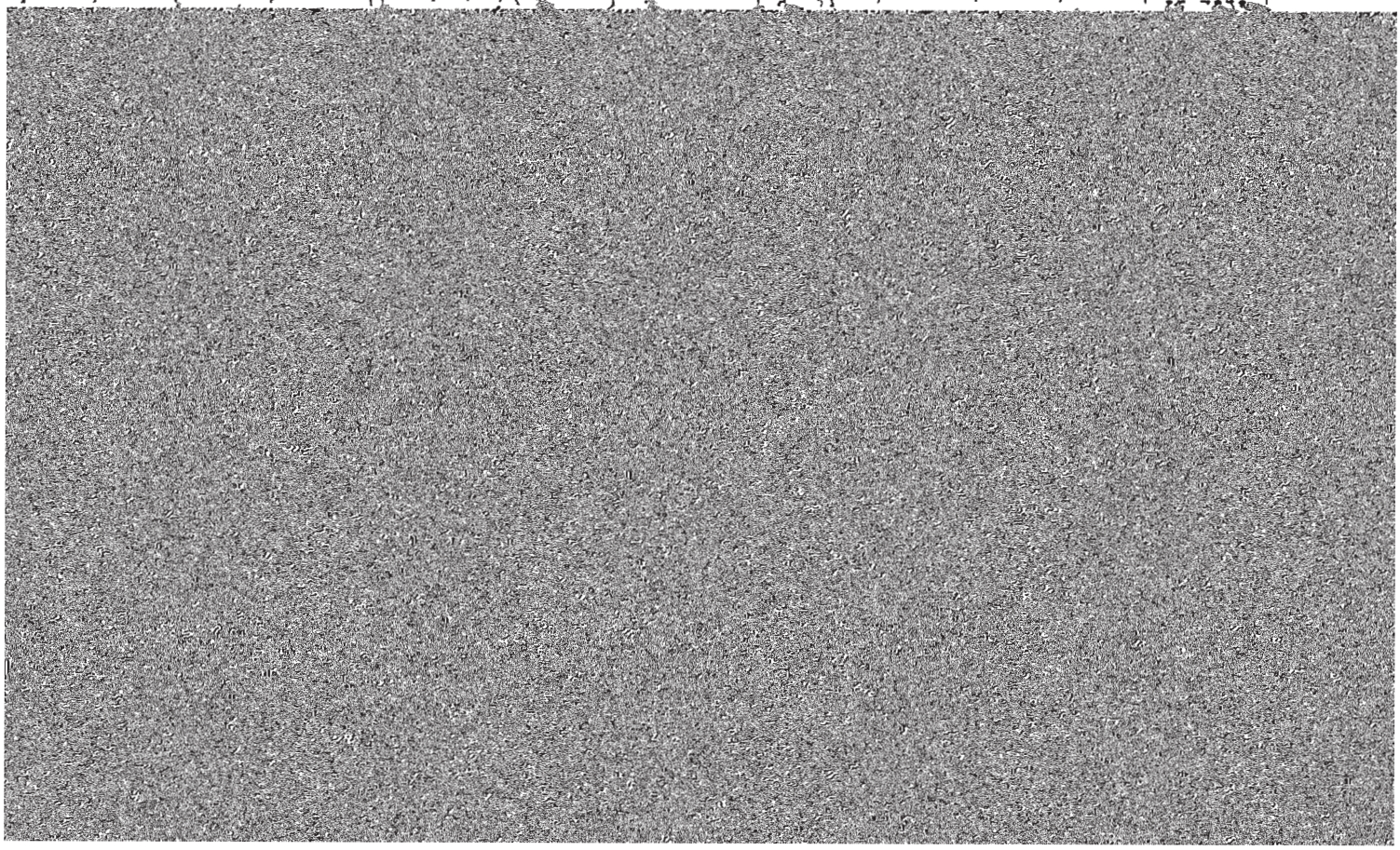


TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-75 at Rochelle, Ill.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 24	May 3	May 16
2 years in 10 later than--	April 19	April 28	May 11
5 years in 10 later than--	April 9	April 20	May 1
First freezing temperature in fall:			
1 year in 10 earlier than--	October 15	October 10	September 26
2 years in 10 earlier than--	October 20	October 15	October 1
5 years in 10 earlier than--	October 31	October 24	October 12

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-75 at Rochelle, Ill.]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	183	168	142
8 years in 10	190	175	149
5 years in 10	204	186	162
2 years in 10	219	199	177
1 year in 10	228	207	186

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
21B	Pecatonica silt loam, 2 to 5 percent slopes	591	0.1
21C2	Pecatonica silt loam, 5 to 10 percent slopes, eroded	3,847	0.8
21D2	Pecatonica silt loam, 10 to 15 percent slopes, eroded	600	0.1
22C2	Westville silt loam, 5 to 10 percent slopes, eroded	755	0.2
22D2	Westville silt loam, 10 to 15 percent slopes, eroded	438	0.1
24B	Dodge silt loam, 2 to 5 percent slopes	778	0.2
24C2	Dodge silt loam, 5 to 10 percent slopes, eroded	1,273	0.3
27B	Miami loam, 2 to 5 percent slopes	446	0.1
27C2	Miami loam, 5 to 10 percent slopes, eroded	6,128	1.3
27D2	Miami loam, 10 to 15 percent slopes, eroded	2,433	0.5
27E2	Miami loam, 15 to 20 percent slopes, eroded	477	0.1
29D2	Dubuque silt loam, 7 to 15 percent slopes, eroded	789	0.2
36A	Tama silt loam, 0 to 2 percent slopes	6,985	1.4
36B	Tama silt loam, 2 to 5 percent slopes	53,078	10.8
36C2	Tama silt loam, 5 to 10 percent slopes, eroded	14,238	2.9
41	Muscatine silt loam	9,912	2.0
55B	Sidell silt loam, 2 to 5 percent slopes	1,319	0.3
60C2	La Rose silt loam, 5 to 10 percent slopes, eroded	848	0.2
61	Atterberry silt loam	1,714	0.4
68	Sable silty clay loam	2,463	0.5
73	Ross loam	1,088	0.2
74	Radford silt loam	6,510	1.3
77	Huntsville silt loam	1,514	0.3
82	Millington silt loam	501	0.1
87B	Dickinson sandy loam, 1 to 5 percent slopes	2,740	0.6
87C	Dickinson sandy loam, 5 to 12 percent slopes	559	0.1
88B	Sparta loamy sand, 0 to 6 percent slopes	727	0.1
102	La Hogue loam	6,874	1.4
103	Houghton muck	264	0.1
105B	Batavia silt loam, 1 to 5 percent slopes	827	0.2
107	Sawmill silty clay loam	2,158	0.4
119C2	Elco silt loam, 5 to 10 percent slopes, eroded	642	0.1
123	Riverwash	305	0.1
125	Selma clay loam	9,789	2.0
145B	Saybrook silt loam, 2 to 5 percent slopes	7,501	1.5
145C2	Saybrook silt loam, 5 to 10 percent slopes, eroded	5,415	1.1
152	Drummer silty clay loam	20,919	4.2
154A	Flanagan silt loam, 0 to 3 percent slopes	2,820	0.6
171A	Catlin silt loam, 0 to 2 percent slopes	1,458	0.3
171B	Catlin silt loam, 2 to 5 percent slopes	14,130	2.9
171C2	Catlin silt loam, 5 to 10 percent slopes, eroded	6,398	1.3
175B	Lamont sandy loam, 1 to 5 percent slopes	1,240	0.3
[illegible]	[illegible]	[illegible]	[illegible]

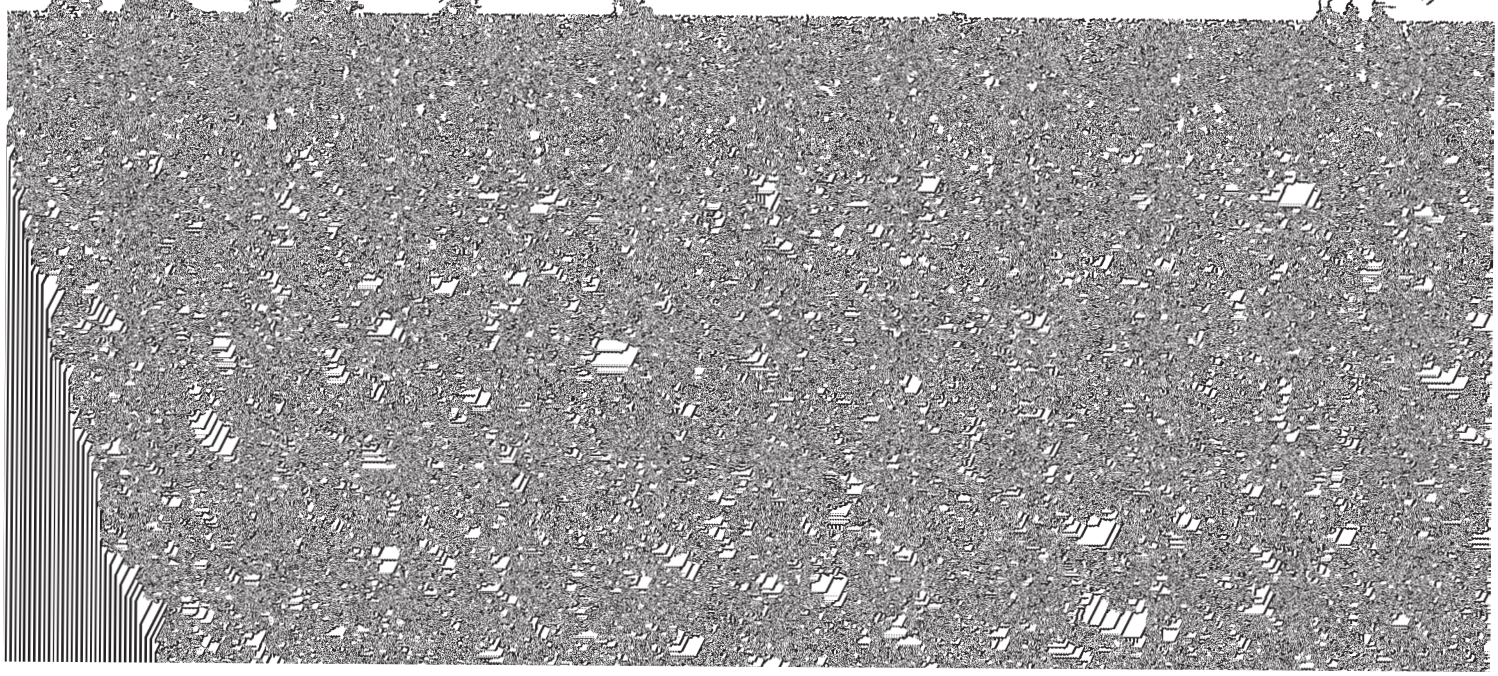


TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
324C2	Ripon silt loam, 5 to 10 percent slopes, eroded	883	0.2
327B	Fox loam, 1 to 5 percent slopes	241	*
347	Canisteo clay loam	3,882	0.8
361B	Kidder loam, 2 to 5 percent slopes	482	0.1
361C2	Kidder loam, 5 to 10 percent slopes, eroded	2,968	0.6
361D2	Kidder loam, 10 to 15 percent slopes, eroded	855	0.2
363B	Griswold loam, 2 to 5 percent slopes	1,992	0.4
363C2	Griswold loam, 5 to 10 percent slopes, eroded	3,779	0.8
386A	Downs silt loam, 0 to 2 percent slopes	686	0.1
386B	Downs silt loam, 2 to 5 percent slopes	13,869	2.8
387A	Ockley silt loam, 0 to 2 percent slopes	364	0.1
387B	Ockley silt loam, 2 to 5 percent slopes	425	0.1
397B	Boone sand, 2 to 7 percent slopes	208	*
397D	Boone sand, 7 to 15 percent slopes	840	0.2
397F	Boone sand, 15 to 45 percent slopes	2,703	0.6
398A	Wea silt loam, 0 to 2 percent slopes	1,174	0.2
398B	Wea silt loam, 2 to 5 percent slopes	690	0.1
410B	Woodbine silt loam, 2 to 5 percent slopes	234	*
410C2	Woodbine silt loam, 5 to 10 percent slopes, eroded	699	0.1
411B	Ashdale silt loam, 2 to 5 percent slopes	6,359	1.3
411C2	Ashdale silt loam, 5 to 10 percent slopes, eroded	4,023	0.8
412B	Ogle silt loam, 2 to 5 percent slopes	11,864	2.4
412C2	Ogle silt loam, 5 to 10 percent slopes, eroded	5,751	1.2
414B	Myrtle silt loam, 2 to 5 percent slopes	2,410	0.5
415	Orion silt loam	2,346	0.5
416B	Durand silt loam, 2 to 5 percent slopes	533	0.1
416C2	Durand silt loam, 5 to 10 percent slopes, eroded	1,430	0.3
419B	Flagg silt loam, 2 to 5 percent slopes	4,714	1.0
419C2	Flagg silt loam, 5 to 10 percent slopes, eroded	2,753	0.6
429B	Palsgrove silt loam, 2 to 5 percent slopes	2,016	0.4
429C2	Palsgrove silt loam, 5 to 10 percent slopes, eroded	2,427	0.5
440A	Jasper loam, 0 to 2 percent slopes	6,748	1.4
440B	Jasper loam, 2 to 5 percent slopes	16,701	3.3
440C2	Jasper loam, 5 to 10 percent slopes, eroded	2,345	0.5
451	Lawson silt loam	15,369	3.1
490	Odell loam	2,765	0.6
503B	Rockton silt loam, 2 to 5 percent slopes	2,357	0.5
503C2	Rockton silt loam, 5 to 10 percent slopes, eroded	3,657	0.7
504D	Sogn loam, 7 to 15 percent slopes	4,027	0.8
504F	Sogn loam, 15 to 45 percent slopes	3,418	0.7
505C2	Dunbarton silty clay loam, 5 to 12 percent slopes, eroded	279	0.1
505E2	Dunbarton silty clay loam, 12 to 20 percent slopes, eroded	297	0.1
509B	Whalan loam, 2 to 5 percent slopes	598	0.1
509C2	Whalan loam, 5 to 10 percent slopes, eroded	4,813	1.0
509D2	Whalan loam, 10 to 15 percent slopes, eroded	2,202	0.5
509E2	Whalan loam, 15 to 30 percent slopes, eroded	1,344	0.3
570A	Martinsville silt loam, 0 to 2 percent slopes	1,315	0.3
570B	Martinsville silt loam, 2 to 5 percent slopes	6,436	1.3
570C2	Martinsville silt loam, 5 to 10 percent slopes, eroded	3,511	0.7
570D2	Martinsville silt loam, 10 to 15 percent slopes, eroded	1,180	0.2
661B	Atkinson silt loam, 2 to 5 percent slopes	1,148	0.2
661C2	Atkinson silt loam, 5 to 10 percent slopes, eroded	275	0.1
727B	Waukee loam, 1 to 5 percent slopes	860	0.2
728C2	Winnebago silt loam, 5 to 10 percent slopes, eroded	384	0.1
742B	Dickinson sandy loam, loamy substratum, 1 to 5 percent slopes	2,258	0.5
742C	Dickinson sandy loam, loamy substratum, 5 to 12 percent slopes	461	0.1
761B	Eleva sandy loam, 2 to 7 percent slopes	550	0.1
761D	Eleva sandy loam, 7 to 15 percent slopes	1,187	0.2
761F	Eleva sandy loam, 15 to 35 percent slopes	687	0.1
776	Comfrey clay loam	8,366	1.7
779B	Chelsea loamy sand, 1 to 7 percent slopes	711	0.1
779D	Chelsea loamy sand, 7 to 15 percent slopes	1,286	0.3
802	Orthents, loamy	1,253	0.3
864	Pits, quarries	525	0.1
865	Pits, gravel	467	0.1
919C	Rodman-Fox complex, 5 to 12 percent slopes	768	0.2
919E	Rodman-Fox complex, 12 to 20 percent slopes	617	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
939C	Rodman-Warsaw complex, 5 to 12 percent slopes	773	0.2
939E	Rodman-Warsaw complex, 12 to 20 percent slopes	361	0.1
4776	Comfrey clay loam, ponded	549	0.1
6506B	Hitt Variant sandy loam, 2 to 5 percent slopes	666	0.1
6506C	Hitt Variant sandy loam, 5 to 10 percent slopes	495	0.1
	Water	3,840	0.8
	Total	488,320	100.0

* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
21B---------- Pecatonica	117	35	49	64	4.7	7.8
21C2---------- Pecatonica	111	33	46	61	4.4	7.4
21D2---------- Pecatonica	106	32	44	59	4.2	7.0
22C2---------- Westville	107	33	44	60	3.9	6.6
22D2---------- Westville	103	32	42	58	3.8	6.3
24B---------- Dodge	125	41	63	69	5.0	8.4
24C2---------- Dodge	118	38	51	66	4.8	8.0
27B---------- Miami	120	40	51	67	4.8	7.9
27C2---------- Miami	114	38	48	64	4.5	7.5
27D2---------- Miami	109	36	46	61	4.3	7.2
27E2---------- Miami	102	34	43	57	4.0	6.7
29D2---------- Dubuque	75	23	32	48	3.1	5.1
36A---------- Tama	155	46	62	89	5.9	9.8
36B---------- Tama	153	46	61	88	5.8	9.7
36C2---------- Tama	146	43	58	84	5.5	9.2
41---------- Muscatine	167	51	64	95	6.2	10.3
55B---------- Sidell	136	45	57	79	5.4	9.1
60C2---------- La Rose	116	39	49	70	4.5	7.5
61---------- Atterberry	149	44	60	85	5.6	9.3
68----------	156	51	61	85	5.6	9.3

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
74---------- Radford	143	46	61	84	5.6	9.3
77---------- Huntsville	152	48	64	86	5.8	9.6
82---------- Millington	133	41	52	68	4.6	7.7
87B---------- Dickinson	98	37	45	76	3.9	6.4
87C---------- Dickinson	96	36	44	75	3.8	6.3
88B---------- Sparta	84	29	37	52	3.3	3.5
102---------- La Hogue	129	43	56	80	5.2	8.6
103---------- Houghton	129	44	---	---	---	7.3
105B---------- Batavia	137	43	54	80	5.3	8.9
107---------- Sawmill	147	47	54	76	5.5	9.2
119C2---------- Elco	105	35	44	60	4.1	6.9
123**. Riverwash						
125---------- Selma	136	44	53	76	5.0	8.3
145B---------- Saybrook	138	46	59	83	5.5	9.2
145C2---------- Saybrook	130	43	56	79	5.3	8.7
152---------- Drummer	154	51	61	83	5.5	9.2
154A---------- Flanagan	162	52	67	92	6.1	10.2
171A---------- Catlin	150	46	61	87	5.8	9.7
171B---------- Catlin	149	46	60	86	5.7	9.6
171C2---------- Catlin	141	43	57	82	5.5	9.1
175B---------- Lamont	96	36	45	76	3.7	6.1
175C---------- Lamont	94	35	44	75	3.6	6.0
198---------- Elburn	161	50	63	94	6.1	10.2
199A---------- Plano	151	45	60	90	5.8	9.7

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
199B---------- Plano	151	45	60	90	5.8	9.7
199C2---------- Plano	143	43	57	86	5.5	9.2
219---------- Millbrook	144	43	59	81	5.4	9.0
221B---------- Parr	128	44	56	77	5.2	8.7
221C2---------- Parr	114	41	54	73	5.0	8.3
223B---------- Varna	122	41	52	74	4.8	7.9
223C2---------- Varna	116	38	50	71	4.5	7.5
233B---------- Birkbeck	122	41	54	69	5.0	8.2
233C2---------- Birkbeck	116	38	52	66	4.7	7.8
242A---------- Kendall	135	41	55	75	5.2	8.7

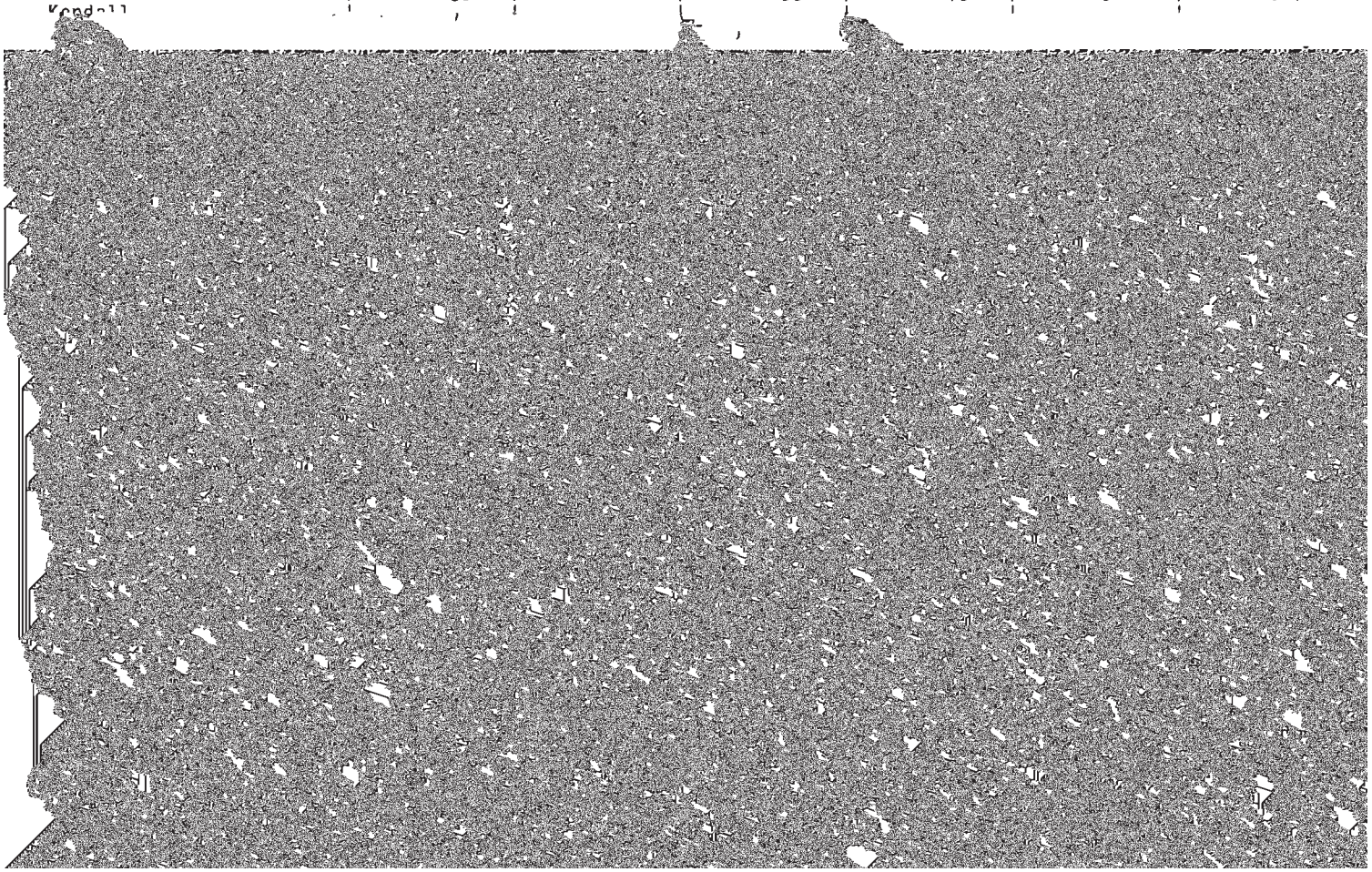


TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
321---------- Du Page	132	40	53	70	5.0	8.0
324B---------- Ripon	105	39	46	71	4.4	7.2
324C2---------- Ripon	100	37	43	68	4.1	6.9
327B---------- Fox	105	33	46	63	4.3	7.1
347---------- Canisteo	132	44	53	77	5.3	8.8
361B---------- Kidder	100	35	45	66	4.1	6.7
361C2---------- Kidder	95	33	42	63	3.9	6.4
361D2---------- Kidder	91	32	41	60	3.7	6.1
363B---------- Griswold	111	41	55	75	4.8	7.9
363C2---------- Griswold	105	39	53	71	4.5	7.5
386A---------- Downs	148	43	59	83	5.6	9.3
386B---------- Downs	147	43	58	82	5.5	9.2
387A---------- Ockley	126	42	51	75	5.0	8.3
387B---------- Ockley	125	42	50	74	5.0	8.2
397B---------- Boone	50	18	25	37	2.5	4.2
397D---------- Boone	---	---	---	25	1.5	---
397F---------- Boone	---	---	---	---	---	---
[illegible]	144	47	61	80	5.5	9.2

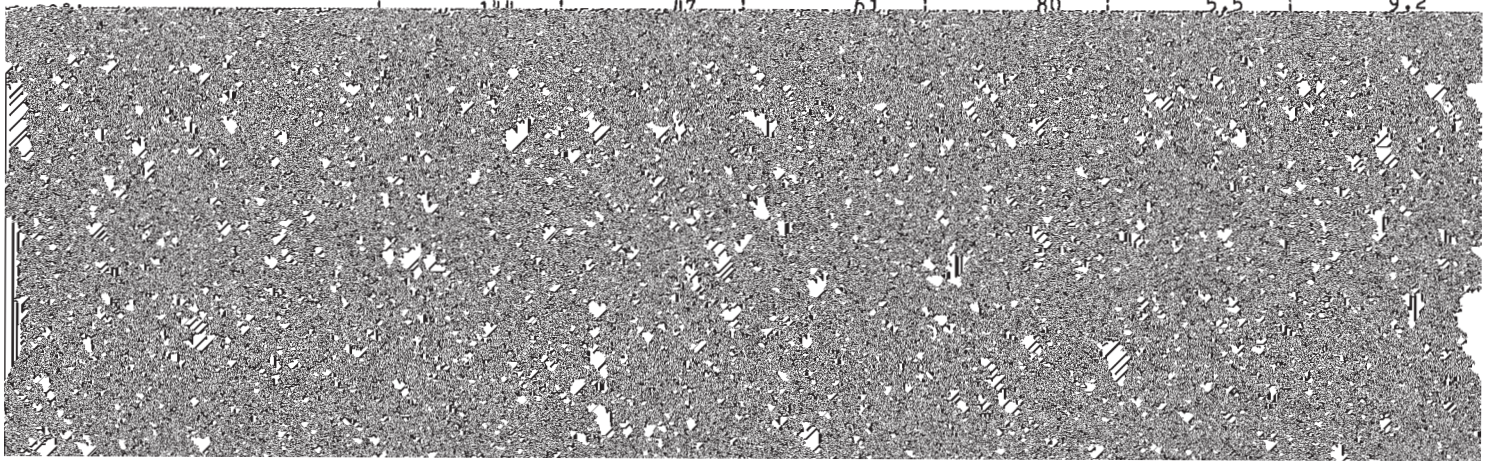


TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
412B---- Ogle	139	36	47	68	4.5	7.4
412C2---- Ogle	132	32	41	62	4.0	6.8
424B---- Myrtle	124	36	44	64	4.2	6.9
415---- Orion	135	---	---	75	4.5	---
416B---- Durand	129	44	57	72	4.7	8.0
416C2---- Durand	122	40	52	66	4.3	7.4
419B---- Flagg	120	33	40	58	4.0	6.6
419C2---- Flagg	114	28	36	52	3.6	6.0
429B---- Palsgrove	107	32	---	55	3.7	6.0
429C2---- Palsgrove	101	24	---	47	3.5	5.5
440A---- Jasper	138	46	52	---	4.3	---
440B---- Jasper	137	44	50	---	4.1	---
440C2---- Jasper	130	42	48	---	4.0	---
451---- Lawson	161	---	---	80	4.0	---
490---- Odell	143	46	58	---	4.3	---
503B---- Rockton	108	26	---	65	4.0	5.6
503C2---- Rockton	102	22	---	57	3.5	4.9
504D, 504F---- Sogn	---	---	---	---	---	---
505C2---- Dunbarton	66	---	---	60	3.0	---
505E2---- Dunbarton	---	---	---	---	2.7	---
509B---- Whalan	97	28	40	71	4.2	6.9

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
509C2---------- Whalan	92	26	38	68	3.9	6.6
509D2---------- Whalan	88	25	36	65	3.8	6.3
509E2---------- Whalan	---	---	---	---	3.2	5.4
570A---------- Martinsville	121	37	51	66	4.8	8.0
570B---------- Martinsville	120	37	50	65	4.8	7.9
570C2---------- Martinsville	114	35	48	62	4.5	7.5
570D2---------- Martinsville	109	33	46	59	4.3	7.2
661B---------- Atkinson	119	39	49	67	4.8	7.9
661C2---------- Atkinson	113	37	46	64	4.5	7.5
727B---------- Waukee	102	35	46	65	4.1	6.9
728C2---------- Winnebago	114	38	48	64	4.5	7.5
742B---------- Dickinson	108	36	49	68	4.4	7.3
742C---------- Dickinson	102	34	46	65	4.1	6.9
761B---------- Eleva	65	20	23	37	2.4	4.0
761D---------- Eleva	60	---	---	---	2.2	3.6
761F---------- Eleva	---	---	---	---	1.8	3.0
776---------- Comfrey	140	46	51	66	5.0	8.3
779B---------- Chelsea	65	23	34	46	2.5	4.2
779D---------- Chelsea	---	---	---	41	2.3	3.9
802**. Orthents						
864**, 865**. Pits						
919C---------- Rodman	---	---	---	---	2.3	3.8

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
919E---------- Rodman	---	---	---	---	2.0	3.4
939C, 939E---------- Rodman	---	---	---	---	2.1	3.5
4776---------- Comfrey	---	---	---	---	---	---
6506B---------- Hitt Variant	107	40	47	64	4.4	7.4
6506C---------- Hitt Variant	105	39	46	63	4.4	7.3

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

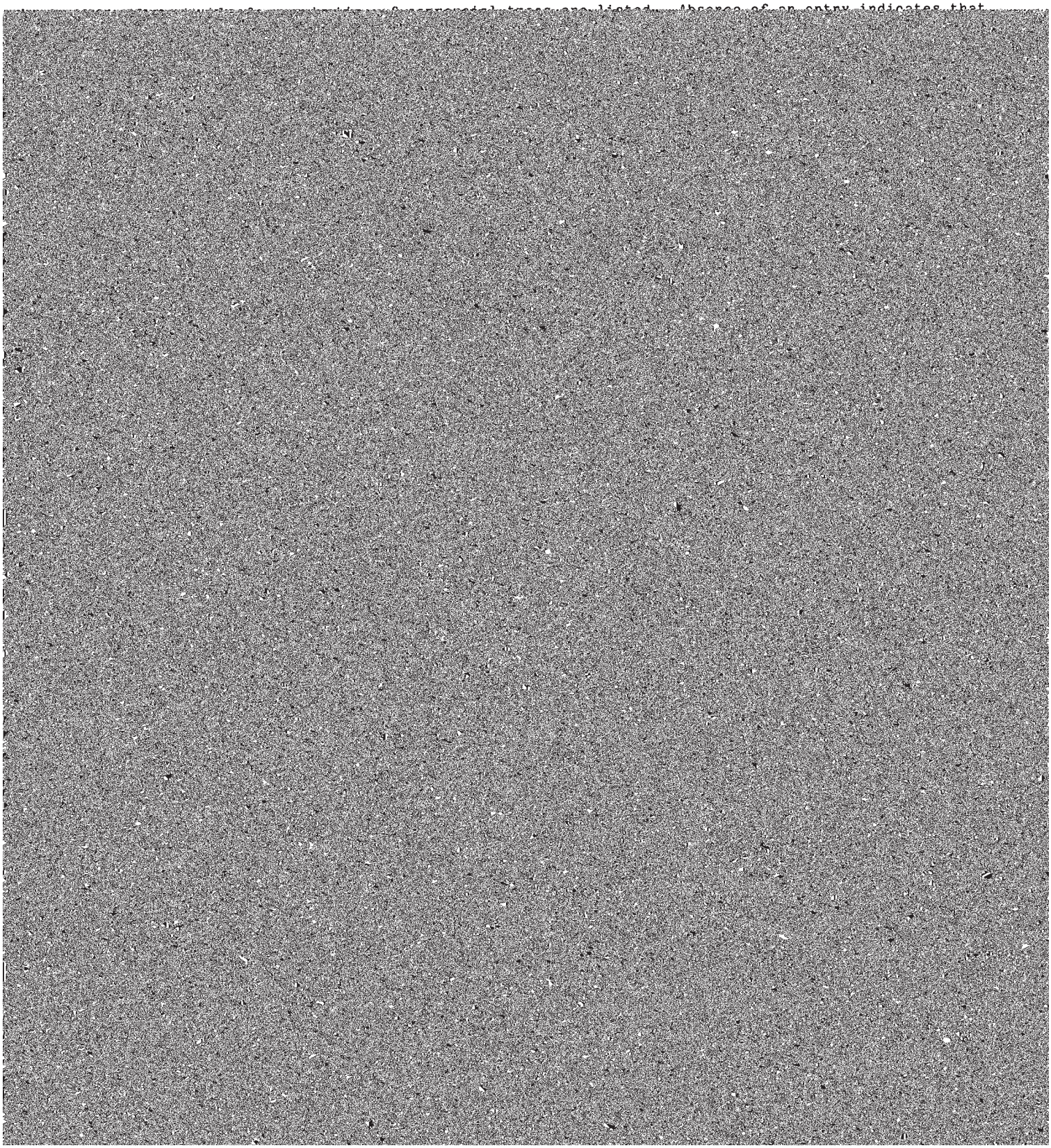


TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
73---------- Ross	1o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Sugar maple----------	85 95 85	Eastern white pine, black walnut, white oak, white ash, northern red oak, sugar maple, red pine.
74---------- Radford	---	---	---	---	---		---	Green ash, northern red oak, eastern white pine, American sycamore, red pine, white oak, eastern cottonwood.
77---------- Huntsville	1o	Slight	Slight	Slight	Slight	Eastern cottonwood-- American sycamore--- Yellow-poplar------- Cherrybark oak------ Sweetgum------------ Green ash-----------	110 --- 98 --- --- ---	Eastern cottonwood, black walnut, American sycamore, red maple, sugar maple, green ash, common hackberry.
82---------- Millington	---	---	---	---	---		---	Black spruce, American sycamore, pin oak, swamp white oak, green ash, common hackberry, European larch, red maple.
87B, 87C---------- Dickinson	---	---	---	---	---		---	Eastern white pine, red pine, white ash.
88B---------- Sparta	3s	Slight	Slight	Severe	Slight	Northern red oak---- Red pine------------ Eastern white pine-- Jack pine-----------	70 --- --- ---	Eastern white pine, red pine.
102---------- La Hogue	---	---	---	---	---		---	American sycamore, eastern cottonwood, green ash, white oak, northern red oak, eastern white pine.
103---------- Houghton	3w	Slight	Severe	Severe	Severe	Red maple---------- Silver maple-------- White ash---------- Quaking aspen------- Tamarack------------ Green ash---------- Northern white-cedar	51 76 51 56 45 --- 27	
105B---------- Batavia	2o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Black walnut--------	80 --- ---	White oak, northern red oak, black walnut, green ash, eastern white pine, red pine, sugar maple.
107---------- Sawmill	---	---	---	---	---		---	Black spruce, American sycamore, green ash, common hackberry, pin oak, swamp white oak, European larch, red maple.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	

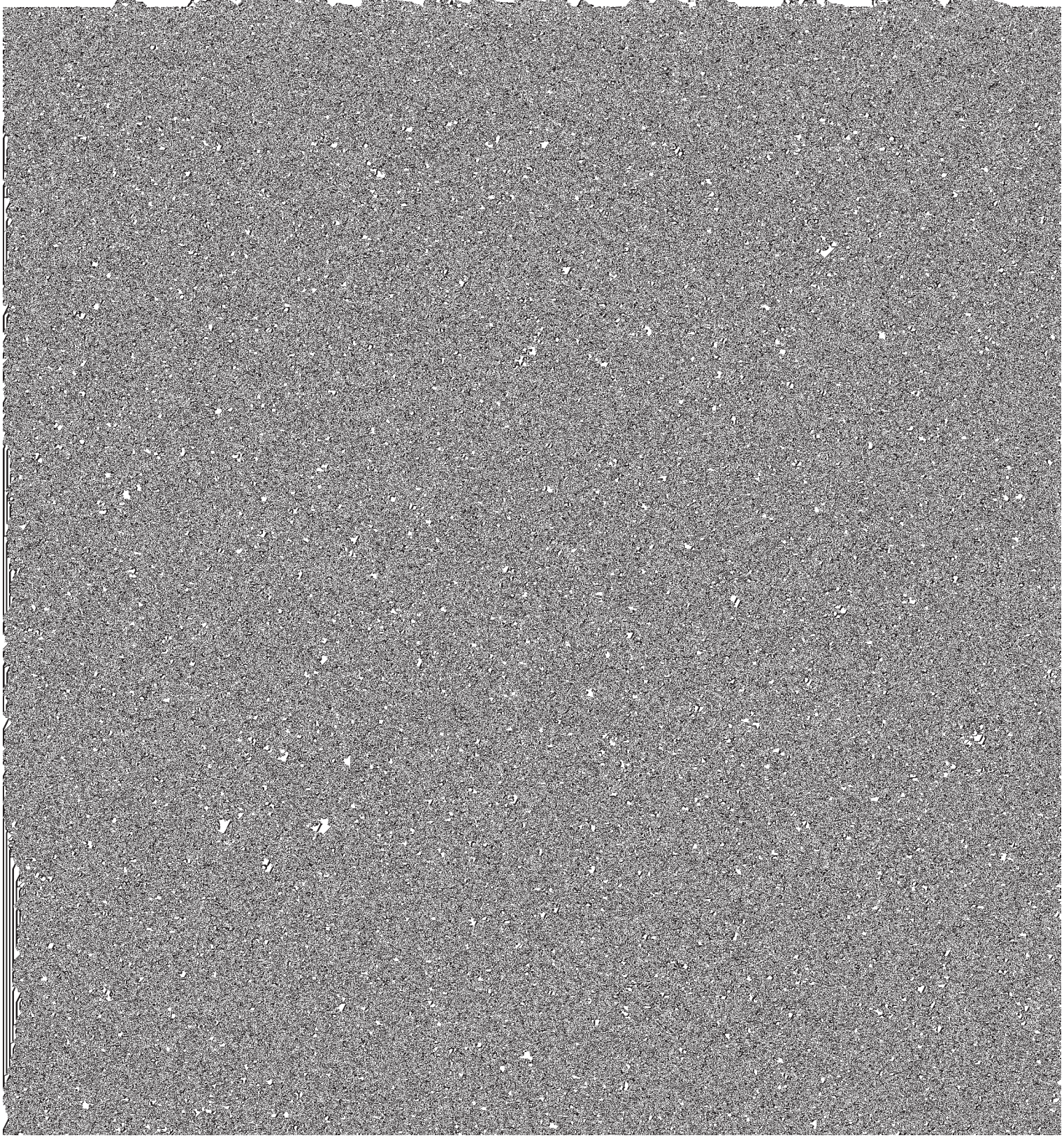


TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
221B, 221C2-------- Parr	---	---------	---------	---------	---------		---	Eastern white pine, red pine, northern red oak, white ash, white oak, sugar maple, black walnut.
223B, 223C2-------- Varna	---	---------	---------	---------	---------		---	Eastern redcedar, jack pine.
233B, 233C2-------- Birkbeck	1o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Green ash----------	85 --- ---	White oak, northern red oak, green ash, black walnut, eastern white pine, red pine, sugar maple.
242A--------------- Kendall	2o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Yellow-poplar------- Black walnut--------	80 80 90 ---	White oak, sugar maple, northern red oak, green ash, eastern white pine, red pine.
243A, 243B, 243C2-- St. Charles	1o	Slight	Slight	Slight	Slight	Yellow-poplar------- White oak---------- Northern red oak---- Sweetgum---------- Green ash----------	96 85 86 --- ---	White oak, northern red oak, black walnut, green ash, sugar maple, eastern white pine, red pine.
259B, 259C2-------- Assumption	---	---------	---------	---------	---------		---	Black walnut, white oak, green ash, northern red oak, sugar maple, eastern white pine.
278A--------------- Stronghurst	3o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Green ash---------- Bur oak----------	70 70 --- ---	Eastern white pine, red pine, eastern redcedar.
279A--------------- Rozetta	2o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Yellow-poplar------- Black walnut--------	80 80 90 ---	Eastern white pine, northern red oak, green ash, white oak, sugar maple, red pine.
280B, 280C2, 280D2- Fayette	2o	Slight	Slight	Slight	Slight	White oak---------- northern red oak----	75 80	Eastern white pine, red pine, white oak, Northern red oak, green ash, black walnut, sugar maple.
290B--------------- Warsaw	---	---------	---------	---------	---------		---	Eastern white pine, green ash, northern red oak, black walnut, white oak, white ash, sugar maple.
294B, 294C2-------- Symerton	---	---------	---------	---------	---------		---	White oak, black walnut, northern red oak, green ash, sugar maple, eastern white pine.

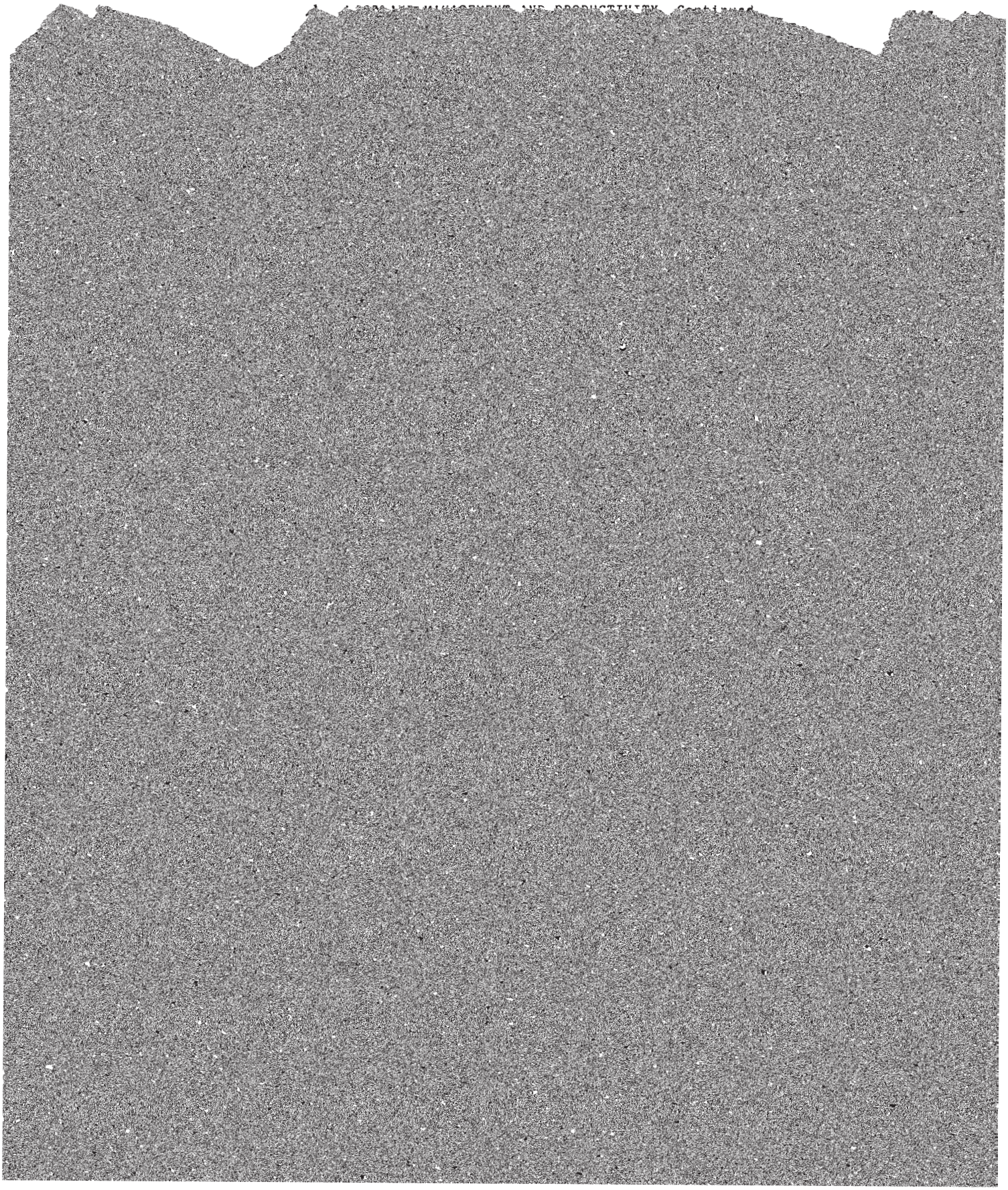


TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
411B, 411C2-------- Ashdale	---	---------	---------	---------	---------		---	Black walnut, northern red oak, white ash, green ash, white oak, eastern white pine, sugar maple.
412B, 412C2-------- Ogle	---	---------	---------	---------	---------		---	Black walnut, sugar maple, green ash, northern red oak, white ash, eastern white pine, white oak.
414B---------- Myrtle	2o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Black walnut--------	80 80 ---	White oak, northern red oak, black walnut, green ash, eastern white pine, red pine, sugar maple.
415---------- Orion	3w	Slight	Moderate	Slight	Slight	Silver maple-------- Eastern cottonwood-- White ash----------	80 --- ---	American sycamore, pin oak, red maple, swamp white oak, eastern cottonwood.
416B, 416C2-------- Durand	---	---------	---------	---------	---------		---	Black walnut, green ash, northern red oak, white oak, sugar maple, eastern white pine.
419B, 419C2-------- Flagg	2o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Black walnut--------	80 80 ---	White oak, northern red oak, black walnut, green ash, eastern white pine, red pine, sugar maple.
429B, 429C2-------- Palsgrove	3o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Green ash---------- Bur oak----------	70 70 --- ---	Eastern white pine, black locust, eastern redcedar, red pine.
440A, 440B, 440C2-- Jasper	---	---------	---------	---------	---------		---	Eastern white pine, green ash, white ash, northern red oak, white oak, black walnut, sugar maple.
451---------- Lawson	4o	Slight	Slight	Slight	Slight	Silver maple-------- White ash---------- American elm--------	70 --- ---	Eastern white pine, eastern redcedar, red pine, black locust, jack pine.
490---------- Odell	---	---------	---------	---------	---------		---	Eastern white pine, green ash, eastern cottonwood, northern red oak, white oak, American sycamore.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and	Ordi-	Management concerns				Potential productivity		
			Equip-					

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
919E*:								
Fox	2r	Moderate	Moderate	Slight	Slight	Northern red oak White oak Sugar maple	80 --- ---	White ash, northern red oak, eastern white pine, red pine, white oak, black locust.
939C*, 939E*:								
Rodman	3s	Slight	Slight	Severe	Slight	Northern red oak White oak Red pine Eastern white pine	70 70 75 85	Eastern white pine, red pine, eastern redcedar, jack pine.
Warsaw	---	---	---	---	---		---	Eastern white pine, green ash, red pine, northern red oak, black walnut, white oak, white ash, sugar maple.
6506B, 6506C Hitt Variant	---	---	---	---	---		---	Northern red oak, green ash, eastern white pine, white ash, white oak, sugar maple.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
21B, 21C2, 21D2--- Pecatonica	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Amur maple, eastern redcedar, flowering dogwood.	Eastern white pine, Norway spruce, Douglas-fir.	Eastern cottonwood.
22C2, 22D2--- Westville	Arrowwood, redosier dogwood, gray dogwood.	Autumn-olive, silky dogwood.	Amur maple, eastern redcedar, flowering dogwood.	Eastern white pine, Norway spruce, Douglas-fir.	Eastern cottonwood.
23B, 23C2---	Gray dogwood,	Autumn-olive,	Flowering dogwood,	Eastern white	Eastern

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
74---------- Radford	Redosier dogwood, gray dogwood.	Autumn-olive, silky dogwood, Amur honeysuckle.	Russian-olive, eastern redcedar.	Eastern white pine, Norway spruce, Douglas-fir.	American sycamore, eastern cottonwood.
77---------- Huntsville	Gray dogwood, redosier dogwood.	Amur honeysuckle, silky dogwood, autumn-olive.	Eastern redcedar, Russian-olive.	Eastern white pine, Norway spruce, Douglas-fir.	Eastern cottonwood, American sycamore.
82---------- Millington	Arrowwood, gray dogwood, redosier dogwood.	Silky dogwood, forsythia.	Baldcypress, Amur maple.	Green ash, pin oak.	Eastern cottonwood, American sycamore, red maple.
87B, 87C---------- Dickinson	Redosier dogwood, gray dogwood.	Autumn-olive, silky dogwood.	Flowering dogwood, eastern redcedar.	Norway spruce, Douglas-fir, eastern white pine.	---
88B---------- Sparta	American hazel, European privet.	Tamarisk, late lilac, forsythia, autumn-olive.	Austrian pine, tall purple willow.	Eastern white pine, red pine, jack pine.	---
102---------- La Hogue	Gray dogwood, redosier dogwood.	Silky dogwood, autumn-olive, Amur honeysuckle.	Russian-olive, eastern redcedar.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood, American sycamore.
103---------- Houghton	Gray dogwood, dwarf purple willow.	Amur honeysuckle, redosier dogwood, silky dogwood.	Northern white-cedar, tall purple willow, medium purple willow.	Pin oak, green ash.	Lombardy poplar.
105B---------- Batavia	Arrowwood, redosier dogwood, gray dogwood.	Silky dogwood, autumn-olive.	Amur maple, eastern redcedar, flowering dogwood.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood.
107---------- Sawmill	Gray dogwood, arrowwood, redosier dogwood.	Silky dogwood, forsythia.	Amur maple, baldcypress.	Green ash, pin oak	Red maple, eastern cottonwood, American sycamore.
119C2---------- Elco	Arrowwood, redosier dogwood, gray dogwood.	Silky dogwood, autumn-olive.	Amur maple, eastern redcedar, flowering dogwood.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood.
123*. Riverwash					
125---------- Selma	Gray dogwood, redosier dogwood.	Amur maple, silky dogwood, oriental arborvitae.	Baldcypress, Russian-olive.	Norway spruce, green ash.	American sycamore, pin oak, eastern cottonwood.
145B, 145C2------- Saybrook	Gray dogwood, redosier dogwood.	Amur honeysuckle, autumn-olive, silky dogwood.	Eastern redcedar, Russian-olive.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood, American sycamore.

See footnote at end of table.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
152---------- Drummer	Redosier dogwood, gray dogwood.	Silky dogwood, Amur maple, oriental arborvitae.	Baldcypress, Russian-olive.	Norway spruce, green ash.	American sycamore, pin oak, eastern cottonwood.
154A---------- Flanagan	Gray dogwood, redosier dogwood.	Autumn-olive, Amur honeysuckle, silky dogwood.	Eastern redcedar, Russian-olive.	Eastern white pine, Norway spruce, Douglas-fir.	Eastern cottonwood, American sycamore.
171A, 171B, 171C2- Catlin	Gray dogwood, redosier dogwood.	Autumn-olive, silky dogwood, Amur honeysuckle.	Russian-olive, eastern redcedar.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood, American sycamore.
175B, 175C-------- Lamont	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Flowering dogwood, Amur maple, eastern redcedar.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood.
198---------- Elburn	Redosier dogwood, gray dogwood.	Silky dogwood, Amur honeysuckle, autumn-olive.	Russian-olive, eastern redcedar.	Eastern white pine, Douglas-fir, Norway spruce.	Eastern cottonwood, American sycamore.
[illegible]	[illegible]	Autumn-olive, Amur	Eastern redcedar	Eastern white	Eastern

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
259B, 259C2---- Assumption	Gray dogwood, redosier dogwood.	Amur honeysuckle, silky dogwood, autumn-olive.	Eastern redcedar, Russian-olive.	Eastern white pine, Norway spruce, Douglas-fir.	Eastern cottonwood, American sycamore.
278A---------- Stronghurst	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Amur maple, eastern redcedar, flowering dogwood.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood.
279A---------- Rozetta	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Russian-olive, flowering dogwood, eastern redcedar.	Norway spruce, eastern white pine, Douglas-fir.	Eastern cottonwood.
280B, 280C2, 280D2---------- Fayette	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Flowering dogwood, Amur maple, eastern redcedar.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood.
290B---------- Warsaw	Redosier dogwood, gray dogwood.	Silky dogwood, Amur honeysuckle, autumn-olive.	Eastern redcedar, Russian-olive.	Norway spruce, eastern white pine, Douglas-fir.	Eastern cottonwood, American sycamore.
294B, 294C2------- Symerton	Gray dogwood, redosier dogwood.	Autumn-olive, Amur honeysuckle, silky dogwood.	Russian-olive, eastern redcedar.	Eastern white pine, Norway spruce, Douglas-fir.	American sycamore, eastern cottonwood.
321---------- Du Page	Redosier dogwood, gray dogwood.	Autumn-olive, silky dogwood.	Russian-olive, Amur maple, baldcypress.	Eastern white pine, Norway spruce.	Eastern cottonwood, American sycamore, red maple.
324B, 324C2------- Ripon	Redosier dogwood, gray dogwood.	Autumn-olive, silky dogwood, Amur honeysuckle.	Russian-olive, eastern redcedar.	Eastern white pine, Norway spruce, Douglas-fir.	American sycamore, eastern cottonwood.
327B---------- Fox	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Flowering dogwood, Amur maple, eastern redcedar.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood.
347---------- Canisteo	Redosier dogwood, gray dogwood, arrowwood.	Silky dogwood, forsythia.	Amur maple, baldcypress.	Green ash, pin oak.	Eastern cottonwood, American sycamore, red maple.
361B, 361C2, 361D2---------- Kidder	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Flowering dogwood, Amur maple, eastern redcedar.	Eastern white pine, Norway spruce, Douglas-fir.	Eastern cottonwood.
363B, 363C2------- Griswold	Gray dogwood, redosier dogwood.	Autumn-olive, Amur honeysuckle, silky dogwood.	Eastern redcedar, Russian-olive.	Eastern white pine, Norway spruce, Douglas-fir.	Eastern cottonwood.

See footnote at end of table.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
386A, 386B-------- Downs	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Flowering dogwood, Amur maple, eastern redcedar.	Norway spruce, eastern white pine, Douglas-fir.	Eastern cottonwood.
387A, 387B-------- Ockley	Redosier dogwood, gray dogwood.	Autumn-olive, Amur honeysuckle, silky dogwood.	Russian-olive, eastern redcedar.	Eastern white pine, Norway spruce, Douglas-fir.	American sycamore, eastern cottonwood.
397B, 397D, 397F-- Boone	Vanhoutte spirea, gray dogwood, indiancurrant coralberry.	Autumn-olive, eastern redcedar, roughleaf dogwood.	Norway spruce, eastern white pine.	---	---
398A, 398B-------- Redosier dogwood,	Silky dogwood,	Russian-olive,	Norway spruce,	American	

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
440A, 440B, 440C2-Jasper	Redosier dogwood, gray dogwood.	Silky dogwood, Amur honeysuckle, autumn-olive.	Eastern redcedar, Russian-olive.	Norway spruce, eastern white pine, Douglas-fir.	Eastern cottonwood, American sycamore.
451	Redosier dogwood	Autumn-olive	Russian-olive	Eastern white	American

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
761B, 761D, 761F--Eleva	Vanhoutte spirea, gray dogwood, indiancurrant coralberry.	Autumn-olive, eastern redcedar, roughleaf dogwood.	Norway spruce, Siberian peashrub.	---	---
776--Comfrey	Redosier dogwood, gray dogwood.	Oriental arborvitae, silky dogwood, Amur maple.	Russian-olive, baldcypress.	Norway spruce, green ash.	American sycamore, eastern cottonwood, pin oak.
779B, 779D--Chelsea	Vanhoutte spirea, gray dogwood, indiancurrant coralberry.	Eastern redcedar, autumn-olive, roughleaf dogwood.	Bur oak, ponderosa pine, jack pine, green ash, common hackberry.	---	---
802*. Orthents					
864*, 865*. Pits					
919C*, 919E*: Rodman	Vanhoutte spirea, gray dogwood, indiancurrant coralberry.	Autumn-olive, eastern redcedar, roughleaf dogwood.	Norway spruce, eastern white pine.	---	---
Fox	Gray dogwood, redosier dogwood, arrowwood.	Autumn-olive, silky dogwood.	Flowering dogwood, Amur maple, eastern redcedar.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood.
939C*, 939E*: Rodman	Vanhoutte spirea, gray dogwood, indiancurrant coralberry.	Autumn-olive, eastern redcedar, roughleaf dogwood.	Norway spruce, eastern white pine.	---	---
Warsaw	Redosier dogwood, gray dogwood.	Silky dogwood, Amur honeysuckle, autumn-olive.	Eastern redcedar, Russian-olive.	Norway spruce, Douglas-fir, eastern white pine.	Eastern cottonwood, American sycamore.
4776--Comfrey	Redosier dogwood, gray dogwood.	Silky dogwood, baldcypress.	Green ash	Black spruce	---
6506B, 6506C--Hitt Variant	Redosier dogwood, gray dogwood.	Silky dogwood, Amur honeysuckle, autumn-olive.	Eastern redcedar, Russian-olive.	Douglas-fir, eastern white pine, Norway spruce.	Eastern cottonwood, American sycamore.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
21B---------- Pecatonica	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
21C2--------- Pecatonica	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
21D2--------- Pecatonica	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
22C2--------- Westville	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
22D2--------- Westville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
24B---------- Dodge	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
24C2--------- Dodge	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
27B---------- Miami	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
27C2---------	Slight----------	Slight----------	Severe:	Slight----------	Slight.

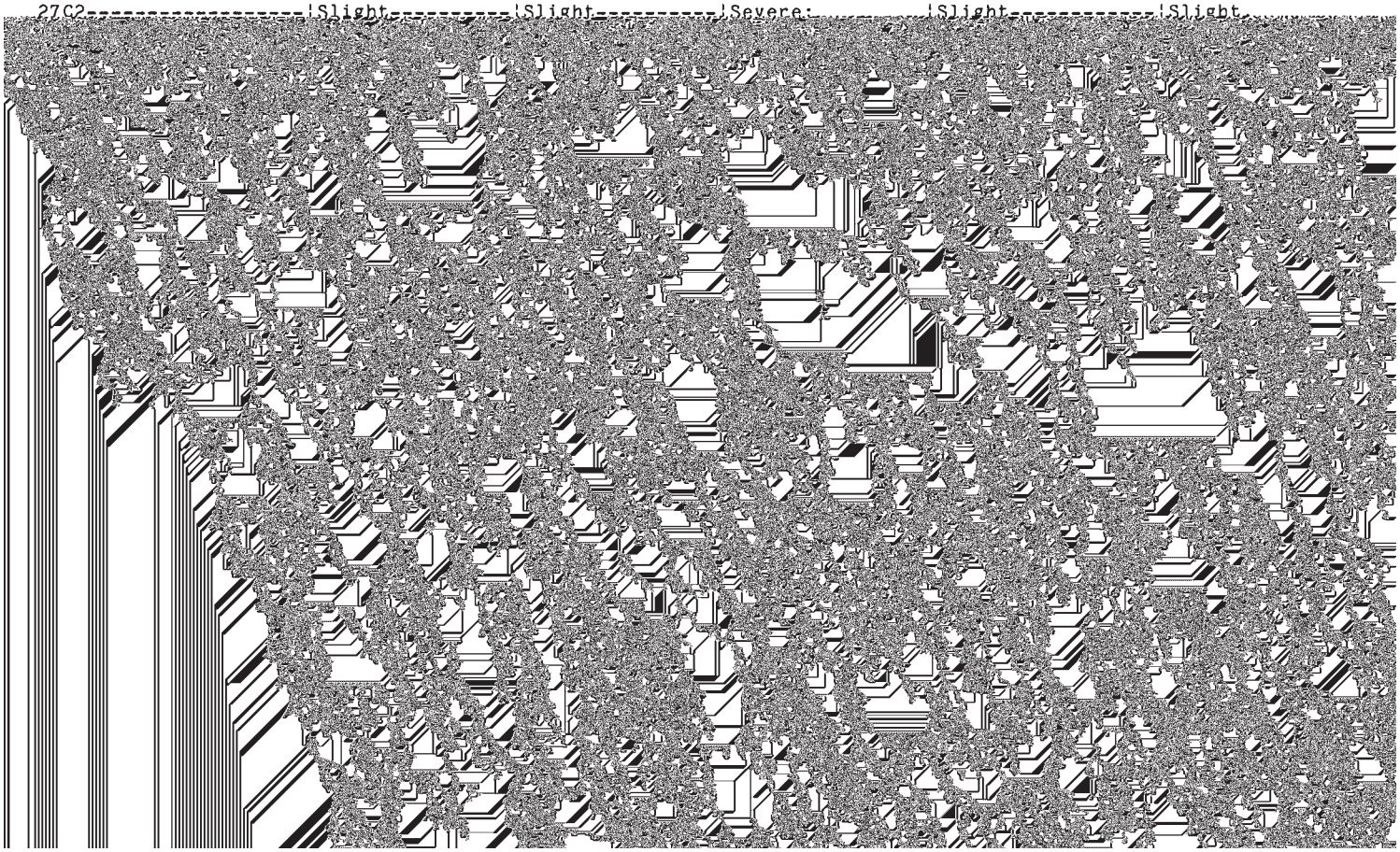


TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
74--- Radford	Severe: floods, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, floods.
77--- Huntsville	Severe: floods.	Slight---	Moderate: floods.	Slight---	Moderate: floods.
82--- Millington	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: floods, wetness.
87B--- Dickinson	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
87C--- Dickinson	Slight---	Slight---	Severe: slope.	Slight---	Slight.
88B--- Sparta	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Moderate: too sandy.
102--- La Hogue	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
103--- Houghton	Severe: wetness, floods, excess humus.	Severe: wetness, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness, floods.
105B--- Batavia	Slight---	Slight---	Moderate: slope.	Slight---	Slight.

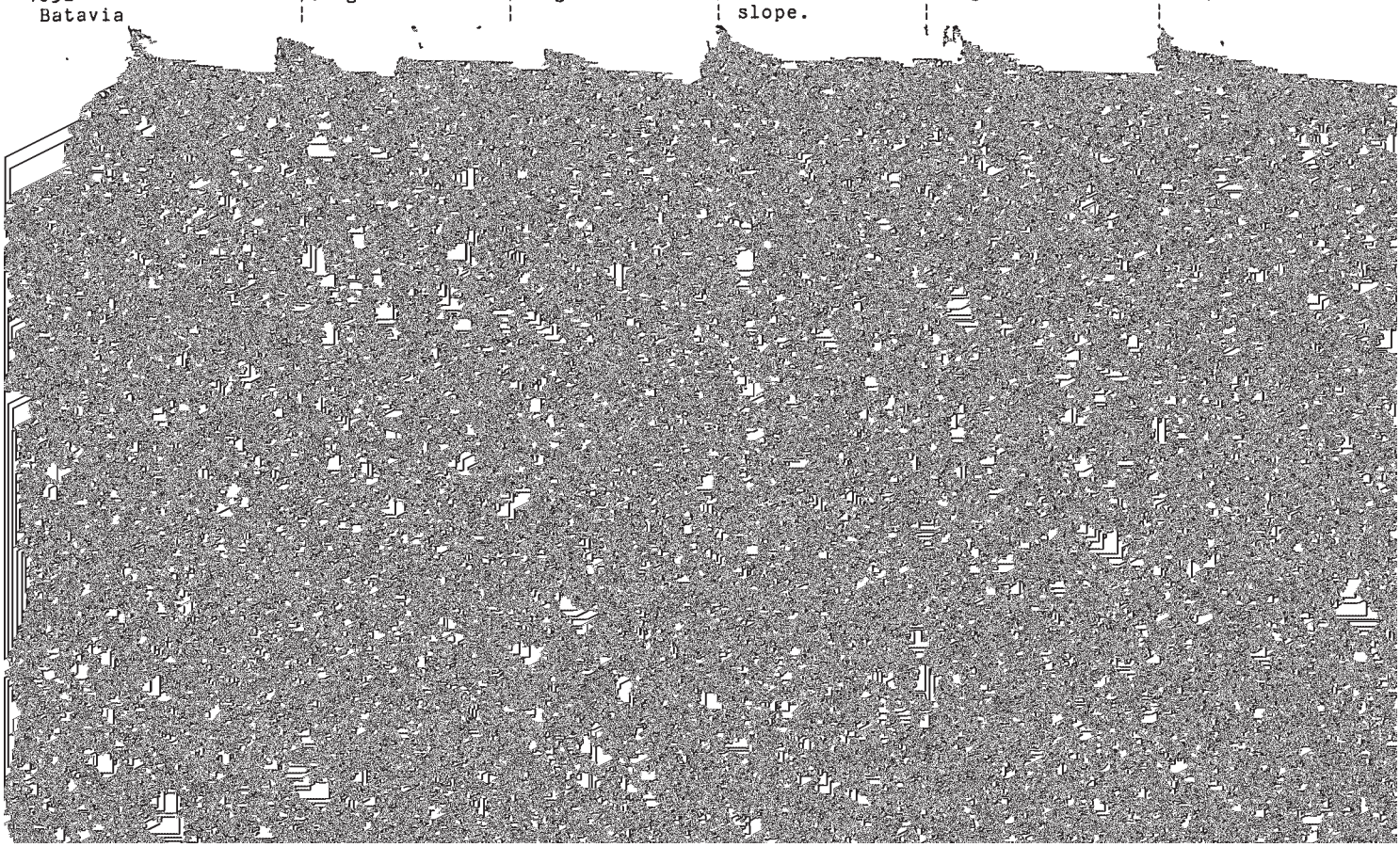


TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
175C---------- Lamont	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
198---------- Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
199A---------- Plano	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
199B---------- Plano	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
199C2---------- Plano	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
219---------- Millbrook	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
221B---------- Parr	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
221C2---------- Parr	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
223B---------- Varna	Moderate: percs slowly.	Slight----------	Moderate: percs slowly, slope.	Slight----------	Slight.
223C2---------- Varna	Moderate: percs slowly.	Slight----------	Severe: slope.	Slight----------	Slight.
233B---------- Birkbeck	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
233C2---------- Birkbeck	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
242A---------- Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
243A---------- St. Charles	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
243B---------- St. Charles	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
243C2---------- St. Charles	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
259B---------- Assumption	Moderate: percs slowly.	Slight----------	Moderate: slope, percs slowly.	Slight----------	Slight.
259C2---------- Assumption	Moderate: percs slowly.	Slight----------	Severe: slope.	Slight----------	Slight.
278A---------- Stronghurst	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
279A---------- Rozetta	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
280B---------- Fayette	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
280C2---------- Fayette	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
280D2--Fayette	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
290B--Warsaw	Slight	Slight	Moderate: slope.	Slight	Slight.
294B--Symerton	Slight	Slight	Moderate: slope.	Slight	Slight.
[illegible]	[illegible]	Slight	Severe:	Slight	Slight.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
398A---- Wea	Slight----	Slight----	Slight----	Slight----	Slight.
398B---- Wea	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
410B---- Woodbine	Moderate: percs slowly.	Slight----	Moderate: slope, percs slowly.	Slight----	Slight.
410C2---- Woodbine	Moderate: percs slowly.	Slight----	Severe: slope.	Slight----	Slight.
411B---- Ashdale	Slight----	Slight----	Moderate: slope, percs slowly.	Slight----	Slight.
411C2---- Ashdale	Slight----	Slight----	Severe: slope.	Slight----	Slight.
412B---- Ogle	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
412C2---- Ogle	Slight----	Slight----	Severe: slope.	Slight----	Slight.
414B---- Myrtle	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
415---- Orion	Severe: floods, wetness.	Moderate: wetness, floods.	Severe: wetness, floods.	Moderate: wetness, floods.	Severe: floods.
416B---- Durand	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
416C2---- Durand	Slight----	Slight----	Severe: slope.	Slight----	Slight.
419B---- Flagg	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
419C2---- Flagg	Slight----	Slight----	Severe: slope.	Slight----	Slight.
429B---- Palsgrove	Severe: percs slowly.	Slight----	Severe: percs slowly.	Slight----	Slight.
429C2---- Palsgrove	Severe: percs slowly.	Moderate: slope.	Severe: slope, percs slowly.	Slight----	Moderate: slope.
440A---- Jasper	Slight----	Slight----	Slight----	Slight----	Slight.
440B---- Jasper	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
440C2---- Jasper	Slight----	Slight----	Severe: slope.	Slight----	Slight.
451---- Lawson	Severe: floods, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, floods.
490---- Odell	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
503B---------- Rockton	Slight----------	Slight----------	Moderate: depth to rock, slope.	Slight----------	Moderate: thin layer.
503C2---------- Rockton	Slight----------	Slight----------	Severe: slope.	Slight----------	Moderate: thin layer.
504D---------- Sogn	Severe: depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Slight----------	Severe: thin layer.
504F---------- Sogn	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Moderate: slope.	Severe: thin layer, slope.
505C2---------- Dunbarton	Moderate: slope, percs slowly.	Moderate: slope, too clayey.	Severe: slope, depth to rock.	Moderate: too clayey.	Severe: thin layer.
505E2---------- Dunbarton	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Moderate: too clayey, slope.	Severe: slope, thin layer.
509B---------- Whalan	Moderate: percs slowly.	Slight----------	Moderate: depth to rock, slope, percs slowly.	Slight----------	Moderate: thin layer.
509C2---------- Whalan	Moderate: percs slowly.	Slight----------	Severe: slope.	Slight----------	Moderate: thin layer.
509D2---------- Whalan	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, thin layer.
509E2---------- Whalan	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
570A---------- Martinsville	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
570B---------- Martinsville	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
570C2---------- Martinsville	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
570D2---------- Martinsville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
661B---------- Atkinson	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
661C2---------- Atkinson	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
727B---------- Waukee	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
728C2---------- Winnebago	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
742B---------- Dickinson	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
742C---------- Dickinson	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
761B---------- Eleva	Slight----------	Slight----------	Moderate: depth to rock, slope.	Slight----------	Moderate: thin layer.
761D---------- Eleva	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, thin layer.
761F---------- Eleva	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
776---------- Comfrey	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
779B---------- Chelsea	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Moderate: too sandy.
779D---------- Chelsea	Moderate: too sandy, slope.	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy.	Moderate: too sandy, slope.
802*. Orthents					
864*, 865*. Pits					
919C*: Rodman----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope, small stones.
Fox----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
919E*: Rodman----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope, small stones.
Fox----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
939C*, 939E*: Rodman----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope, small stones.
Warsaw----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
4776---------- Comfrey	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.
6506B---------- Hitt Variant	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
6506C---------- Hitt Variant	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT POTENTIALS

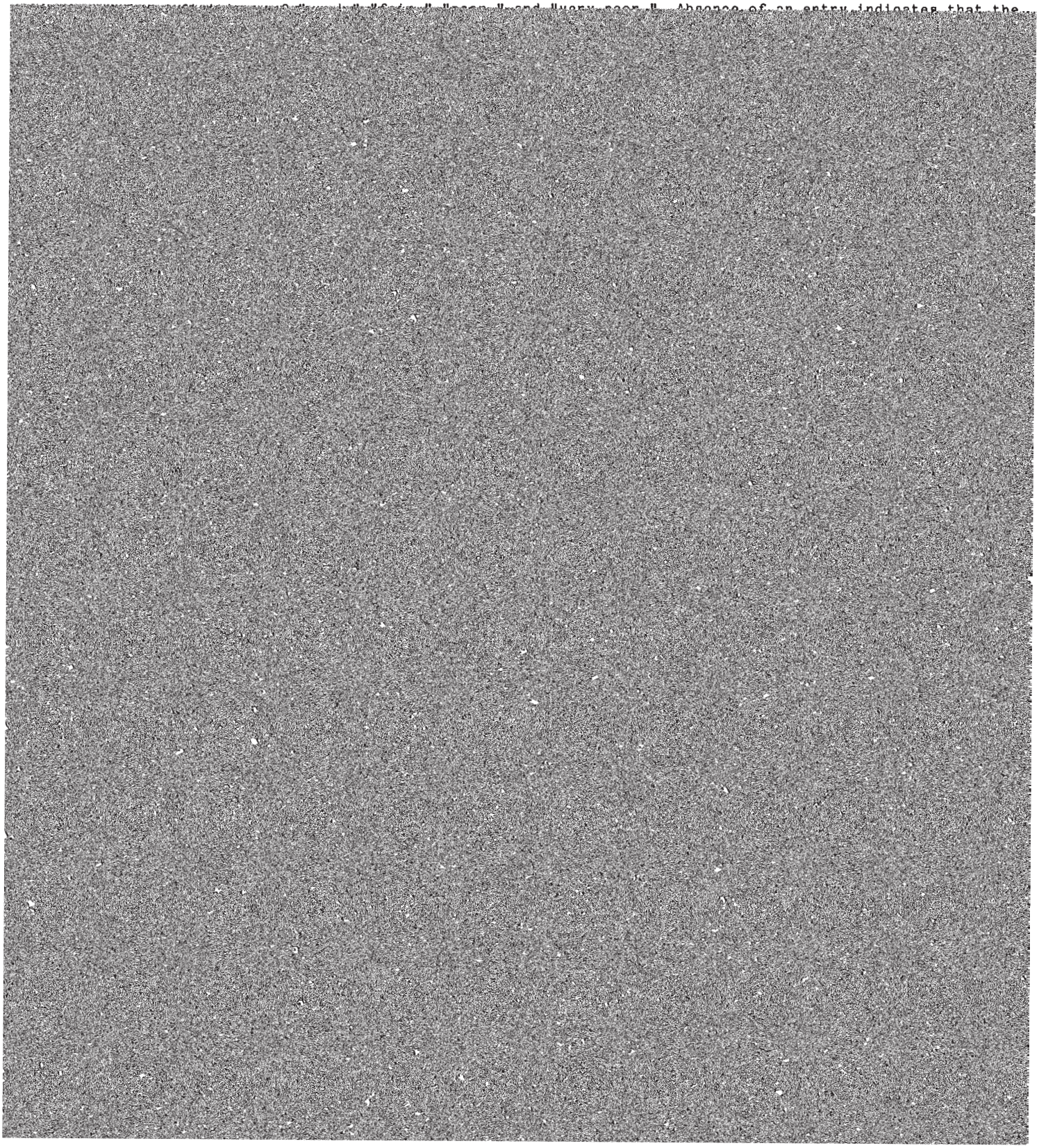


TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
87B---- Dickinson	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
87C---- Dickinson	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
88B---- Sparta	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
102---- La Hogue	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
103---- Houghton	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
105B---- Batavia	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
107---- Sawmill	Good	Good	Good	Fair	Good	Fair	Good	Fair	Poor.
119C2---- Elco	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
123*. Riverwash									
125---- Selma	Good	Good	Good	Good	Good	Good	Good	Good	Good.
145B---- Saybrook	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
145C2---- Saybrook	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
152---- Drummer	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
154A---- Flanagan	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
171A, 171B, 171C2-- Catlin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
175B---- Lamont	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
175C---- Lamont	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
198---- Elburn	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
199A, 199B---- Plano	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
199C2---- Plano	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
219---- Millbrook	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
221B---- Parr	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
221C2--Parr	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
223B--Varna	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
223C2--Varna	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
233B, 233C2--Birkbeck	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
242A--Kendall	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
243A, 243B--St. Charles	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
243C2--St. Charles	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
259B--Assumption	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
259C2--Assumption	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
278A--Stronghurst	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
279A--Rozetta	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
280B--Fayette	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
280C2, 280D2--Fayette	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
290B--Warsaw	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
294B--Symerton	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
294C2--Symerton	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
321--Du Page	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
324B--Ripon	Good	Good	Good	Fair	Very poor	Very poor	Good	Fair	Very poor.
324C2--Ripon	Fair	Good	Good	Fair	Very poor	Very poor	Good	Fair	Very poor.
327B--Fox	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
347--Canisteo	Fair	Fair	Fair	Fair	Good	Good	Fair	Poor	Good.
361B, 361C2--Kidder	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

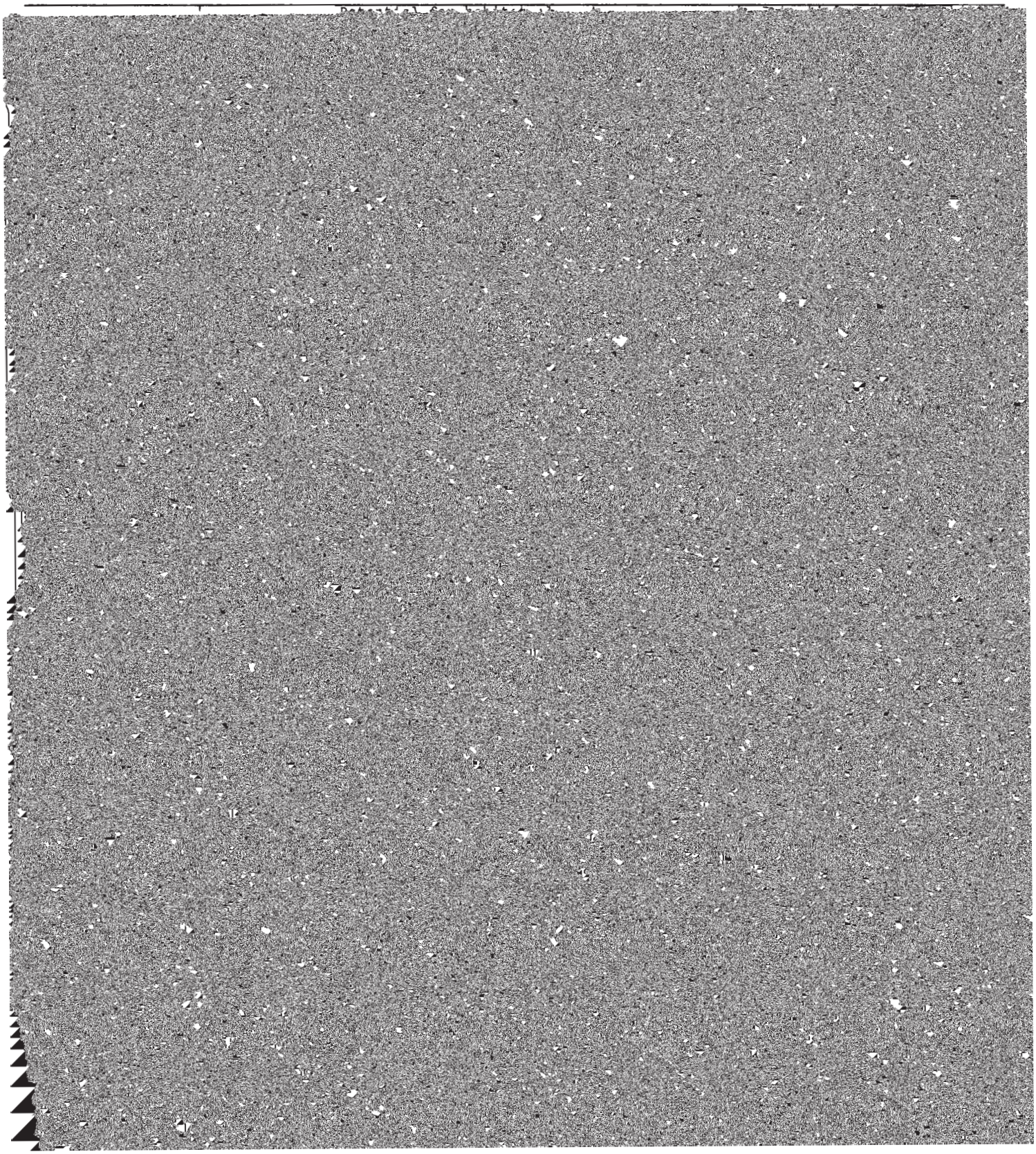


TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
451---------- Lawson	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
490---------- Odell	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
503B, 503C2-------- Rockton	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
504D, 504F--------- Sogn	Very poor	Very poor	Poor	---	Very poor	Very poor	Very poor	---	Very poor.
505C2---------- Dunbarton	Fair	Good	Good	Fair	Very poor	Very poor	Good	Fair	Very poor.
505E2---------- Dunbarton	Poor	Fair	Good	Fair	Very poor	Very poor	Fair	Fair	Very poor.
509B, 509C2, 509D2- Whalan	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
509E2---------- Whalan	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
570A, 570B--------- Martinsville	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
570C2---------- Martinsville	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
570D2---------- Martinsville	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
661B---------- Atkinson	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
661C2---------- Atkinson	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
727B---------- Waukee	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
728C2---------- Winnebago	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
742B---------- Dickinson	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Very poor.
742C---------- Dickinson	Fair	Fair	Fair	Fair	Very poor	Poor	Fair	Fair	Very poor.
761B, 761D--------- Eleva	Good	Good	Good	Good	Very poor	Very poor	Fair	Fair	Very poor.
761F---------- Eleva	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
776---------- Comfrey	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
779B---------- Chelsea	Poor	Fair	Fair	Poor	Very poor	Very poor	Fair	Poor	Very poor.
779D---------- Chelsea	Very poor	Fair	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
802*. Orthents									
864*, 865*. Pits									
919C*: Rodman----------	Very poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Fox----------	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
919E*: Rodman----------	Very poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Fox----------	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
939C*, 939E*: Rodman----------	Very poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Warsaw----------	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
4776---------- Comfrey	Poor	Poor	Fair	Very poor	Good	Good	Poor	Poor	Good.
6506B---------- Hitt Variant	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
6506C---------- Hitt Variant	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
21B---------- Pecatonica	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
21C2---------- Pecatonica	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
21D2---------- Pecatonica	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
22C2---------- Westville	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
22D2---------- Westville	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
24B, 24C2--------- Dodge	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
27B---------- Miami	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell,	Moderate: low strength, frost action.	Slight.
27C2---------- Miami	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Moderate: low strength, frost action.	Slight.
27D2---------- Miami	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
27E2---------- Miami	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
29D2---------- Dubuque	Severe: depth to rock.	Moderate: shrink-swell, slope.	Severe: depth to rock.	Severe: slope.	Severe: low strength, frost action.	Moderate: thin layer, slope.
36A, 36B---------- Tama	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
36C2---------- Tama	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
41---------- Muscatine	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
55B---------- Sidell	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength, frost action.	Slight.
60C2---------- La Rose	Slight---------	Slight---------	Slight---------	Moderate: slope.	Severe: low strength.	Slight.
61---------- Atterberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
68---------- Sable	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods, low strength.	Severe: wetness.
73---------- Ross	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: low strength, floods.	Moderate: floods.
74---------- Radford	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, frost action, floods.	Moderate: wetness, floods.
77---------- Huntsville	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods, frost action, low strength.	Moderate: floods.
82---------- Millington	Severe: wetness,	Severe: floods,	Severe: floods,	Severe: floods,	Severe: low strength,	Severe: wetness.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
145C2---------- Saybrook	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
152---------- Drummer	Severe: wetness,	Severe: wetness,	Severe: wetness,	Severe: wetness,	Severe: wetness,	Severe: wetness.

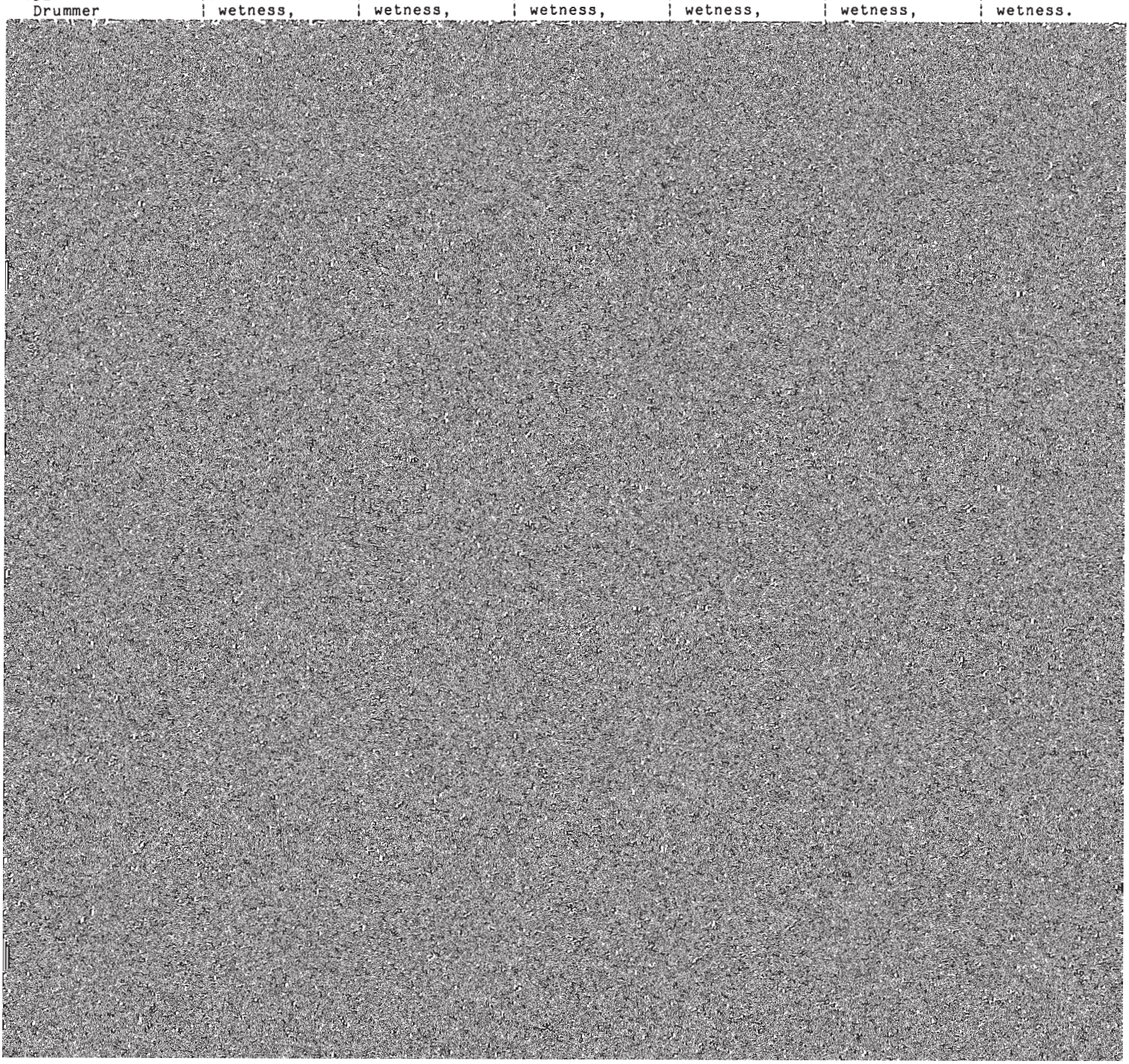


TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
242A---------- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
243A---------- St. Charles	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
243B---------- St. Charles	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
243C2--------- St. Charles	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: slope.	Severe: frost action, low strength.	Slight.
259B---------- Assumption	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
259C2--------- Assumption	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
278A---------- Stronghurst	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
279A---------- Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
280B---------- Fayette	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
280C2--------- Fayette	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
280D2--------- Fayette	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
290B---------- Warsaw	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Severe: low strength.	Slight.
294B---------- Symerton	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
294C2--------- Symerton	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.

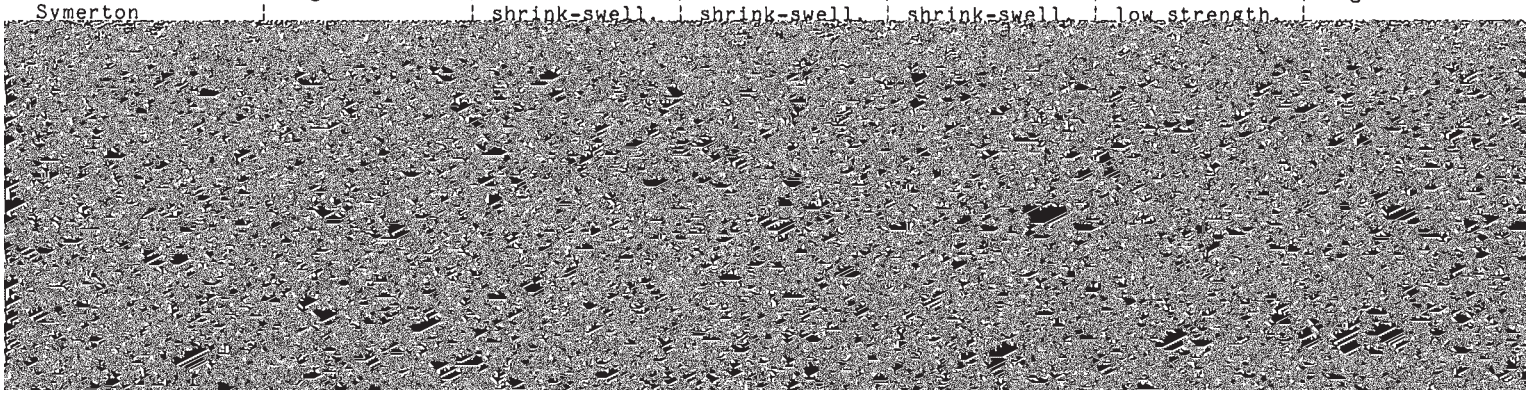


TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
327B---------- Fox	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
347----------	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: low strenght, wetness, floods.	Severe: wetness, floods.
361B, 361C2------- Kidder	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
361D2---------- Kidder	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: slope, low strength, frost action.	Moderate: slope.
363B---------- Griswold	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
363C2---------- Griswold	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
386A, 386B-------- Downs	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
387A---------- Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
387B---------- Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
397B---------- Boone	Severe: cutbanks cave.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Slight---------	Severe: too sandy.
397D---------- Boone	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Severe: too sandy.
397F---------- Boone	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too sandy, slope.
398A, 398B-------- Wea	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
410B---------- Woodbine	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
410C2---------- Woodbine	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, shrink-swell.	Slight.
411B---------- Ashdale	Moderate: depth to rock.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
411C2---------- Ashdale	Moderate: depth to rock.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
412B---------- Ogle	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
412C2--Ogle	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
414B--Myrtle	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
415--Orion	Severe: wetness, floods.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, frost action, low strength.	Severe: floods.
416B--Durand	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
416C2--Durand	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
419B--Flagg	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
419C2--Flagg	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
429B--Palsgrove	Moderate: depth to rock.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
429C2--Palsgrove	Moderate: depth to rock.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
440A, 440B--Jasper	Severe: cutbanks cave.	Slight	Slight	Slight	Severe: low strength.	Slight.
440C2--Jasper	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
451--Lawson	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: frost action, low strength, floods.	Moderate: wetness, floods.
490--Odell	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.

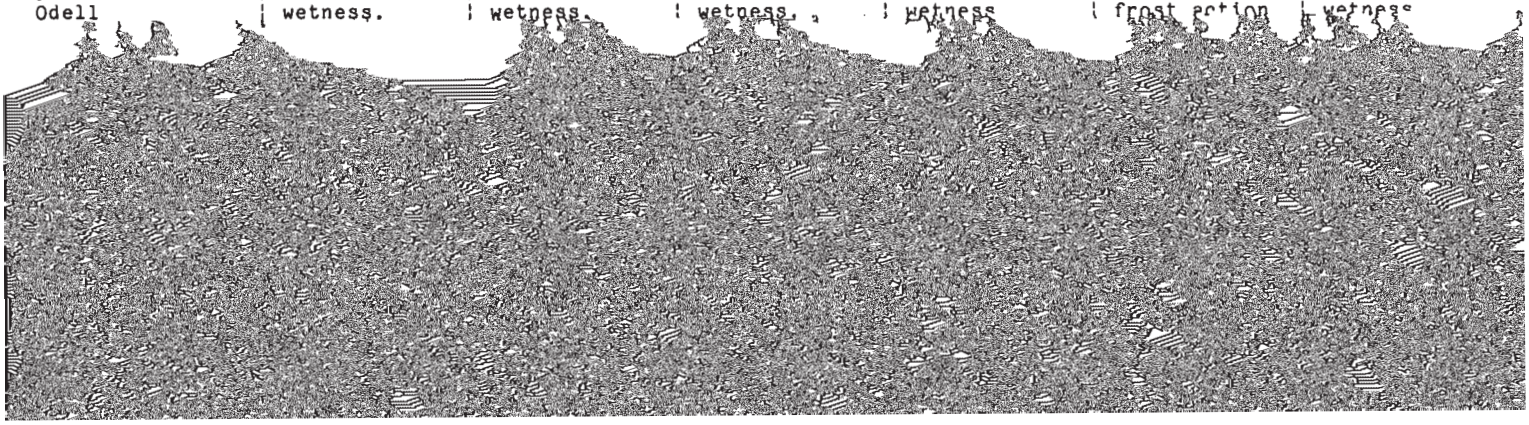


TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
505C2---------- Dunbarton	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: slope, shrink-swell.	Moderate: slope, depth to rock, frost action.	Severe: thin layer.
505E2---------- Dunbarton	Severe: slope, depth to rock.	Severe: slope, shrink-swell.	Severe: depth to rock, slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope.	Severe: slope, thin layer.
509B---------- Whalan	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Slight---------	Moderate: low strength, frost action.	Moderate: thin layer.
509C2---------- Whalan	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Moderate: low strength, frost action.	Moderate: thin layer.
509D2----------	Moderate:	Moderate:	Moderate:	Severe:	Moderate:	Moderate:

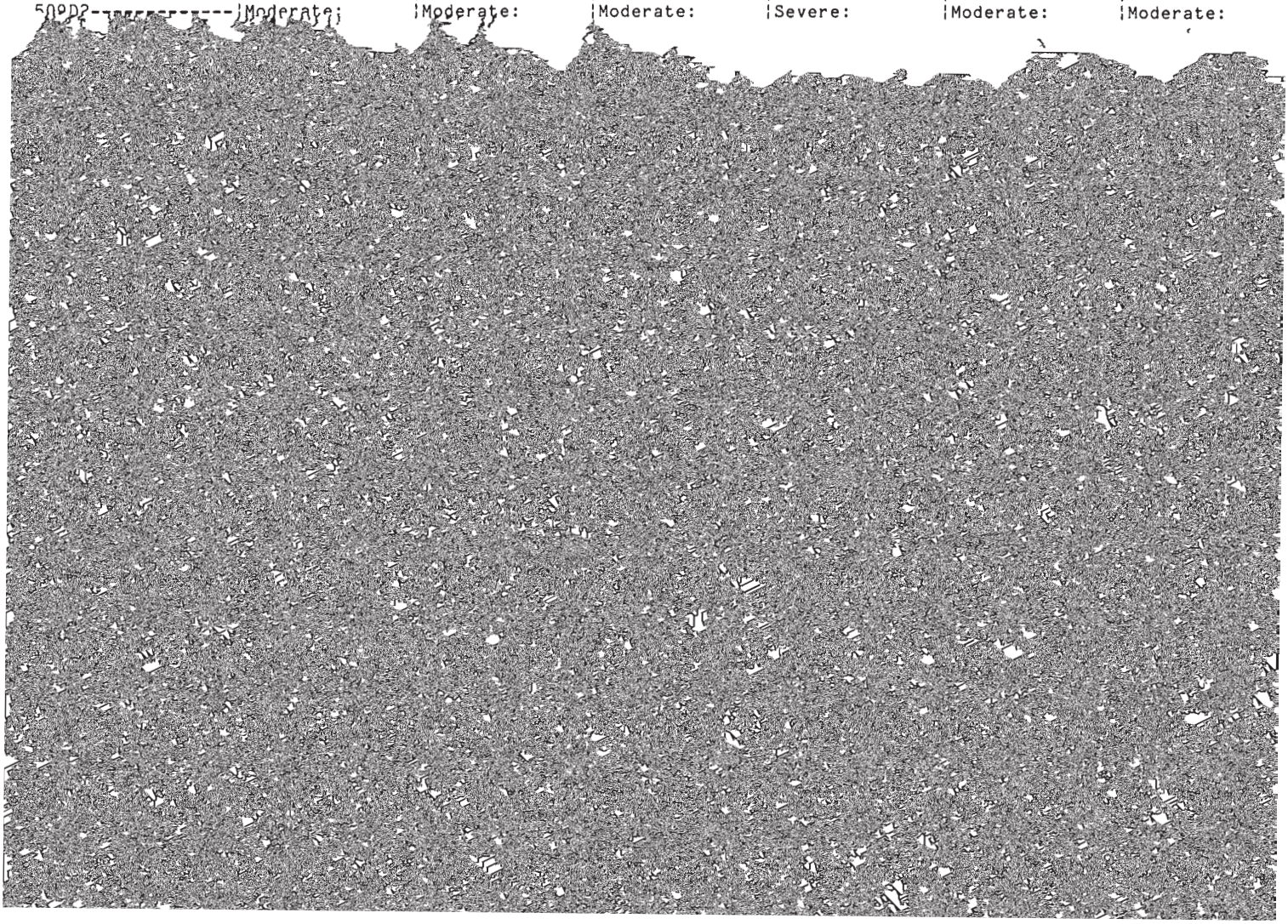


TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
761F---------- Eleva	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
776---------- Comfrey	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods, low strength.	Severe: wetness.
779B---------- Chelsea	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: too sandy.
779D---------- Chelsea	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: too sandy, slope.
802*. Orthents						
864*, 865*. Pits						
919C*: Rodman----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
Fox----------	Severe: cutbanks cave.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
919E*: Rodman----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Fox----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
939C*: Rodman----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
Warsaw----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
939E*: Rodman----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Warsaw----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
4776---------- Comfrey	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods, low strength.	Severe: wetness, floods.
6506B---------- Hitt Variant	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell.	Moderate: frost action, low strength.	Slight.
6506C---------- Hitt Variant	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: slope, shrink-swell.	Moderate: frost action, low strength.	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
21B---------- Pecatonica	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
21C2---------- Pecatonica	Slight----------	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
21D2---------- Pecatonica	Moderate: slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: slope,

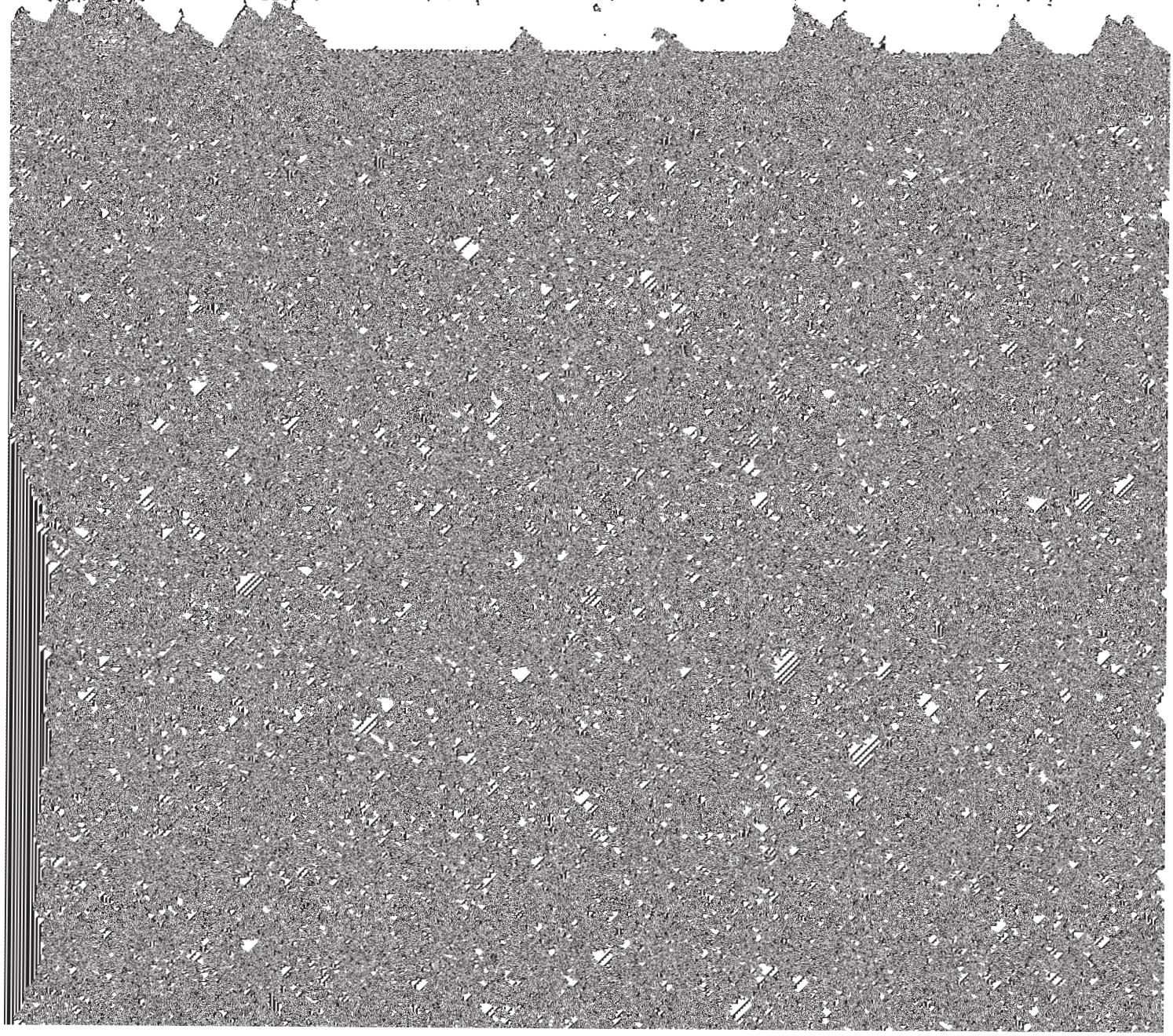


TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
68---------- Sable	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness.
73---------- Ross	Severe: floods.	Severe: floods, seepage.	Severe: floods, wetness, seepage.	Severe: floods, seepage.	Good.
74---------- Radford	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness.
77---------- Huntsville	Severe: floods.	Moderate: seepage.	Severe: floods.	Severe: floods.	Good.
82---------- Millington	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness.
87B---------- Dickinson	Slight----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
87C---------- Dickinson	Slight----------	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
88B---------- Sparta	Slight----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
102---------- La Hogue	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Severe: wetness, seepage.	Poor: wetness.
103---------- Hasbrouck	Severe:	Severe:	Severe:	Severe:	Poor:

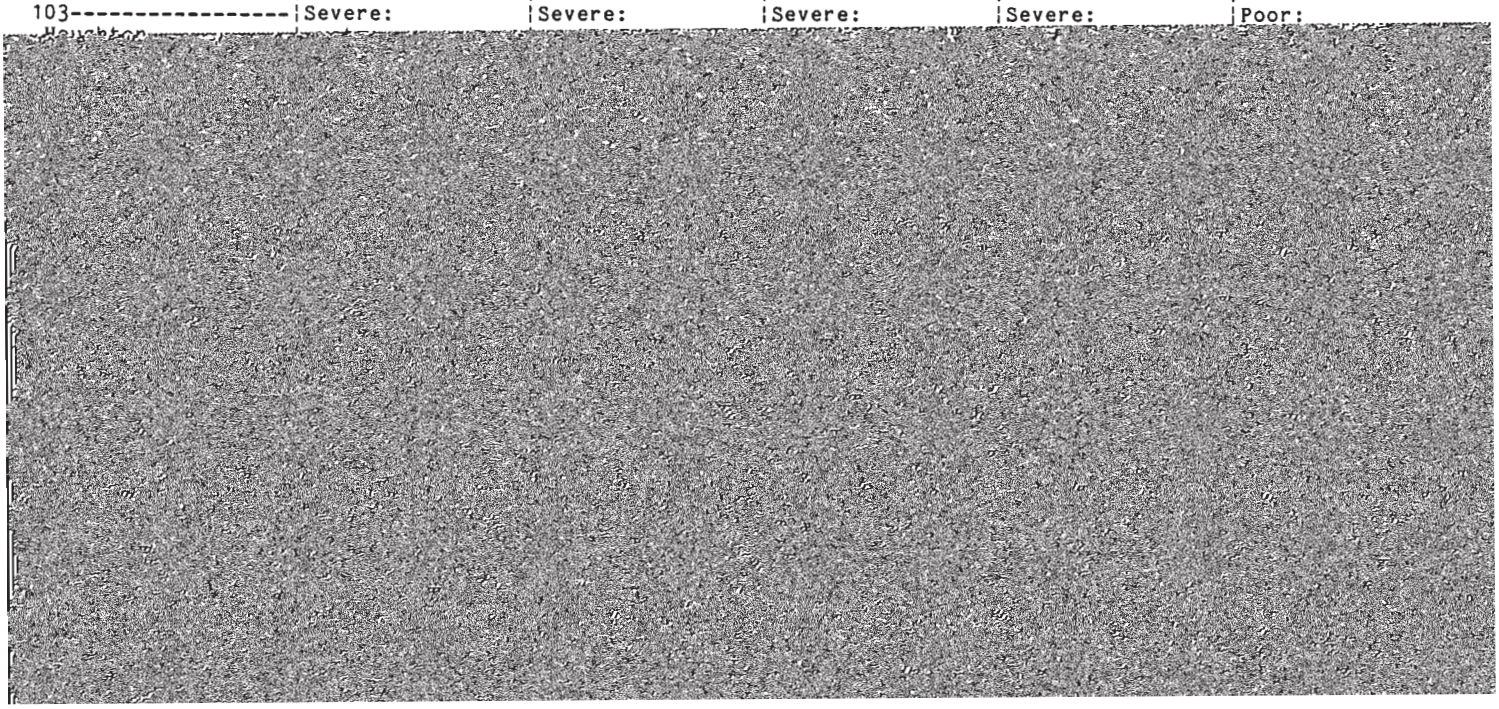


TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
145C2--- Saybrook	Moderate: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
152--- Drummer	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness.
154A--- Flanagan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
171A, 171B--- Catlin	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
171C2--- Catlin	Severe: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
175B--- Lamont	Slight---	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
175C--- Lamont	Slight---	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Good.
198--- Elburn	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness.
199A--- Plano	Slight---	Moderate: seepage.	Moderate: too clayey.	Slight---	Fair: too clayey.
199B--- Plano	Slight---	Moderate: slope, seepage.	Moderate: too clayey.	Slight---	Fair: too clayey.
199C2--- Plano	Slight---	Severe: slope.	Moderate: too clayey.	Slight---	Fair: too clayey.
219--- Millbrook	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
221B--- Parr	Moderate: percs slowly.	Moderate: slope, seepage.	Slight---	Slight---	Good.
221C2--- Parr	Moderate: percs slowly.	Severe: slope.	Slight---	Slight---	Good.
223B--- Varna	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: wetness, too clayey.	Slight---	Fair: too clayey.
223C2--- Varna	Severe: percs slowly, wetness.	Severe: slope.	Moderate: wetness, too clayey.	Slight---	Fair: too clayey.
233B--- Birkbeck	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness, too clayey.
233C2--- Birkbeck	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness, too clayey.
242A--- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
243A, 243B---------- St. Charles	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey.
243C2---------- St. Charles	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey.
259B---------- Assumption	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: too clayey, wetness.	Slight----------	Fair: too clayey, wetness.
259C2---------- Assumption	Severe: percs slowly, wetness.	Severe: slope, wetness.	Moderate: too clayey, wetness.	Slight----------	Fair: too clayey, wetness.
278A---------- Stronghurst	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
279A---------- Rozetta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
280B---------- Fayette	Slight----------	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
280C2---------- Fayette	Slight----------	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
280D2---------- Fayette	Moderate: slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: slope, too clayey.
290B---------- Warsaw	Slight----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones.
294B---------- Symerton	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Fair: too clayey.
294C2---------- Symerton	Severe: percs slowly.	Severe: slope.	Slight----------	Slight----------	Fair: too clayey.
321---------- Du Page	Moderate: floods.	Moderate: seepage.	Moderate: floods.	Moderate: floods.	Good.
324B---------- Ripon	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Poor: area reclaim.
324C2---------- Ripon	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Poor: area reclaim.
327B---------- Fox	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy, seepage.
347---------- Canisteo	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness.
361B---------- Kidder	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
361C2---------- Kidder	Slight----------	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
361D2--- Kidder	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
363B--- Griswold	Slight	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.
363C2--- Griswold	Slight	Severe: slope.	Slight	Slight	Fair: small stones.
386A--- Downs	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
386B--- Downs	Slight	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
387A, 387B--- Ockley	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
397B--- Boone	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: too sandy, seepage.
397D--- Boone	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: too sandy, seepage.
397F--- Boone	Severe: slope, depth to rock.	Severe: seepage, depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope.	Poor: slope, too sandy, seepage.
398A, 398B--- Wea	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
410B--- Woodbine	Severe: depth to rock, percs slowly.	Moderate: depth to rock, slope, seepage.	Severe: depth to rock.	Slight	Fair: too clayey.
410C2--- Woodbine	Severe: depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Slight	Fair: too clayey.
411B--- Ashdale	Severe: percs slowly, depth to rock.	Moderate: slope, depth to rock, seepage.	Severe: depth to rock.	Slight	Fair: area reclaim, too clayey.
411C2--- Ashdale	Severe: percs slowly, depth to rock.	Severe: slope.	Severe: depth to rock.	Slight	Fair: area reclaim, too clayey.
412B--- Ogle	Slight	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
412C2--- Ogle	Slight	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
414B--- Myrtle	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
415---------- Orion	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
416B---------- Durand	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
416C2---------- Durand	Slight----------	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
419B---------- Flagg	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
419C2---------- Flagg	Moderate: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
429B---------- Palsgrove	Severe: depth to rock, percs slowly.	Moderate: depth to rock, seepage, slope.	Severe: depth to rock.	Slight----------	Poor: area reclaim.
429C2---------- Palsgrove	Severe: depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Poor: area reclaim.
440A---------- Jasper	Moderate: percs slowly.	Moderate: seepage.	Slight----------	Slight----------	Good.
440B---------- Jasper	Moderate: percs slowly.	Moderate: slope, seepage.	Slight----------	Slight----------	Good.
440C2---------- Jasper	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight----------	Good.
451---------- Lawson	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness.
490---------- Odell	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
503B---------- Rockton	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Poor: area reclaim.
503C2---------- Rockton	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Poor: area reclaim.
504D---------- Sogn	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
504F---------- Sogn	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
505C2---------- Dunbarton	Severe: depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: thin layer, area reclaim.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
505E2---------- Dunbarton	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: slope, depth to rock.	Poor: slope, thin layer, area reclaim.
509B---------- Whalan	Severe: depth to rock.	Moderate: depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Poor: area reclaim.
509C2---------- Whalan	Severe: depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock.	Poor: area reclaim.
509D2---------- Whalan	Severe: depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope, depth to rock.	Poor: area reclaim.
509E2---------- Whalan	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: area reclaim, slope.
570A---------- Martinsville	Slight----------	Moderate: seepage.	Slight----------	Slight----------	Fair: too clayey.
570B---------- Martinsville	Slight----------	Moderate: seepage, slope.	Slight----------	Slight----------	Fair: too clayey.
570C2---------- Martinsville	Slight----------	Severe: slope.	Slight----------	Slight----------	Fair: too clayey.
570D2---------- Martinsville	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
661B---------- Atkinson	Severe: depth to rock, percs slowly.	Moderate: slope, depth to rock, seepage.	Severe: depth to rock.	Slight----------	Fair: area reclaim.
661C2---------- Atkinson	Severe: depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Slight----------	Fair: area reclaim.
727B---------- Waukee	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy, seepage.
728C2---------- Winnebago	Moderate: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
742B---------- Dickinson	Slight----------	Severe: seepage.	Slight----------	Severe: seepage.	Good.
742C---------- Dickinson	Slight----------	Severe: slope, seepage.	Slight----------	Severe: seepage.	Good.

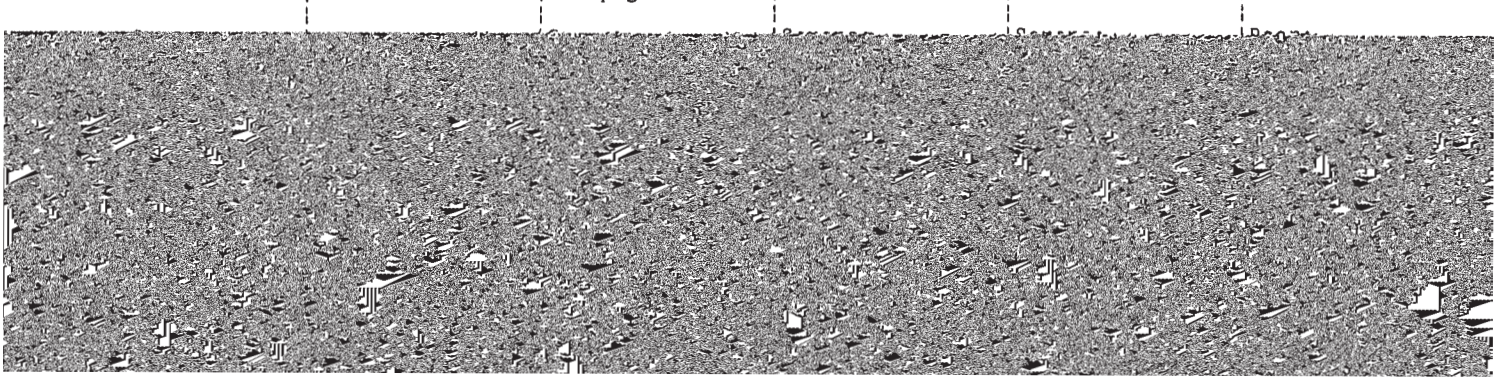


TABLE 11.--SANITARY FACILITIES--Continued

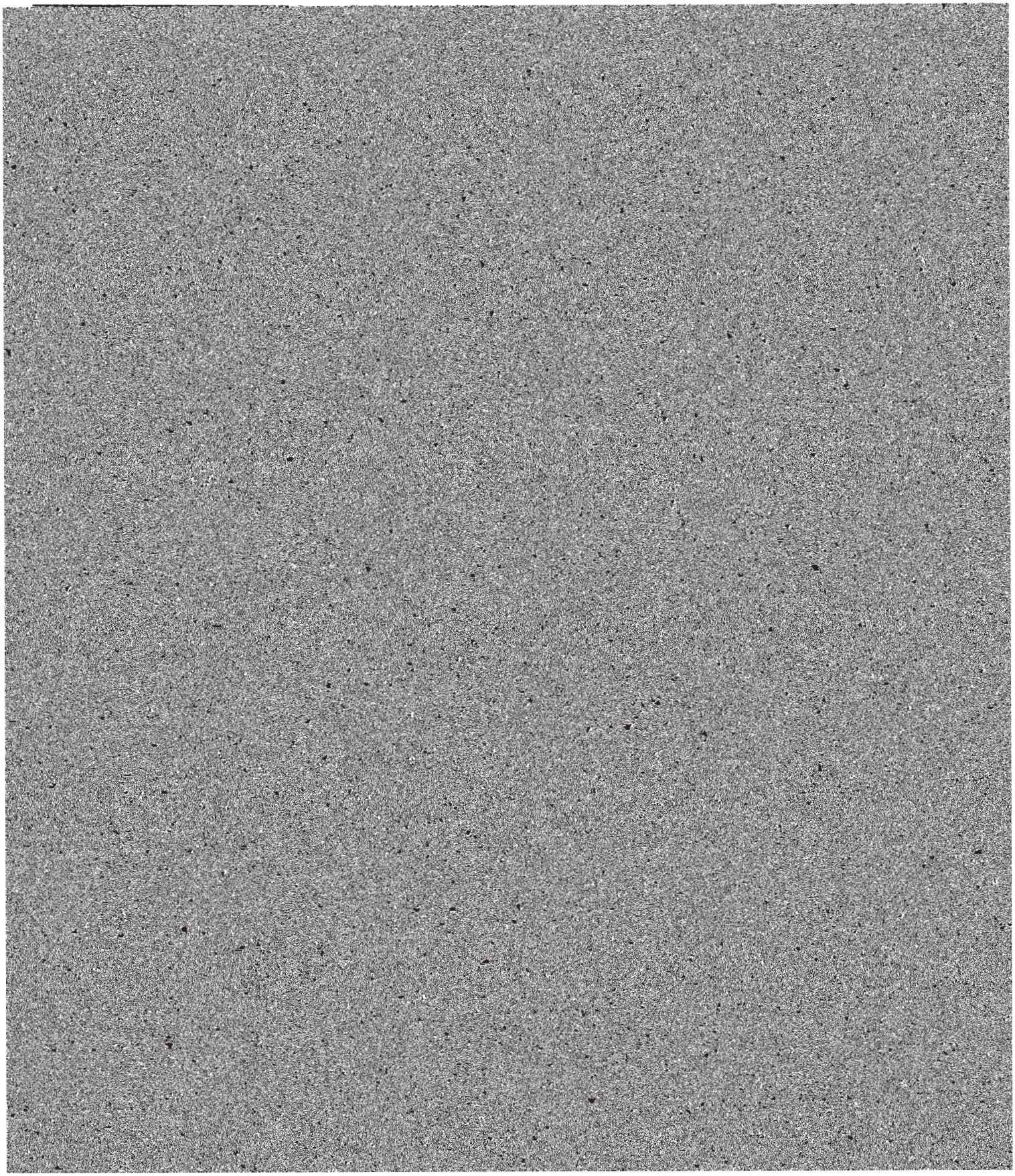


TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
21B, 21C2 Pecatonica	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
21D2 Pecatonica	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
22C2 Westville	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
22D2 Westville	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, slope.
24B, 24C2 Dodge	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
27B, 27C Miami	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
27D2 Miami	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, slope.
27E2 Miami	Fair: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
29D2 Dubuque	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, slope.
36A, 36B, 36C2 Tama	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
41 Muscatine	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
55B	Poor:	Unsuited:	Unsuited:	Fair:

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
87B, 87C---------- Dickinson	Good----------	Fair: excess fines.	Unsuited: excess fines.	Good.
88B---------- Sparta	Good----------	Fair: excess fines.	Unsuited: excess fines.	Fair: too sandy.
102---------- La Hogue	Poor: wetness, low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
103---------- Houghton	Poor: wetness, low strength.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess humus.
105B---------- Batavia	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
107---------- Sawmill	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
223B, 223C2---------- Varna	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
233B, 233C2---------- Birkbeck	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
242A---------- Kendall	Poor: low strength, wetness.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
361C2---------- Kidder	Good----------	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
361D2---------- Kidder	Good----------	Poor: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
363B, 363C2---------- Griswold	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
386A, 386B---------- Downs	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
387A, 387B---------- Ockley	Poor: low strength.	Good----------	Good----------	Fair: thin layer.
397B, 397D---------- Boone	Poor: thin layer, area reclaim.	Poor: thin layer.	Unsuited: excess fines.	Poor: too sandy.
397F---------- Boone	Poor: slope, thin layer, area reclaim.	Poor: thin layer.	Unsuited: excess fines.	Poor: too sandy, slope.
398A, 398B---------- Wea	Poor: low strength.	Good----------	Good----------	Fair: thin layer.
410B, 410C2---------- Woodbine	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
411B, 411C2---------- Ashdale	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
412B, 412C2---------- Ogle	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
414B---------- Myrtle	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
415---------- Orion	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
416B, 416C2---------- Durand	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
419B, 419C2---------- Flagg	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
429B---------- Palsgrove	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
429C2---------- Palsgrove	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, slope.
440A, 440B, 440C2----- Jasper	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
451---------- Lawson	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
490--Odell	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
503B, 503C2--Rockton	Poor: low strength, thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: area reclaim, thin layer.
504D--Sogn	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim.
504F--Sogn	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim, slope.
505C2--Dunbarton	Poor: shrink-swell, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim.
505E2--Dunbarton	Poor: shrink-swell, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, area reclaim.
509B, 509C2--Whalan	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.
509D2--Whalan	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer, area reclaim.
509E2--Whalan	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
570A, 570B, 570C2--Martinsville	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
570D2--Martinsville	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
661B, 661C2--Atkinson	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
727B--Waukee	Good	Good	Unsuited: excess fines.	Good.
728C2--Winnebago	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
742B, 742C--Dickinson	Fair: thin layer.	Poor: thin layer.	Unsuited: excess fines.	Good.
761B--Eleva	Poor: area reclaim, thin layer.	Poor: thin layer.	Unsuited: excess fines.	Fair: area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
761D---------- Eleva	Poor: area reclaim, thin layer.	Poor: thin layer.	Unsuited: excess fines.	Fair: slope, area reclaim.
761F---------- Eleva	Poor: area reclaim, slope, thin layer.	Poor: thin layer.	Unsuited: excess fines.	Poor: slope.
776---------- Comfrey	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
779B, 779D---------- Chelsea	Good----------	Good----------	Unsuited: excess fines.	Poor: too sandy.
802*. Orthents				
864*, 865*. Pits				
919C*: Rodman----------	Fair: slope.	Good----------	Good----------	Poor: small stones, slope.
Fox----------	Good----------	Good----------	Good----------	Fair: thin layer, slope.
919E*: Rodman----------	Fair: slope.	Good----------	Good----------	Poor: small stones, slope.
Fox----------	Fair: slope.	Good----------	Good----------	Poor: slope.
939C*, 939E*: Rodman----------	Fair: slope.	Good----------	Good----------	Poor: small stones, slope.
Warsaw----------	Fair: low strength.	Good----------	Good----------	Fair: slope.
4776---------- Comfrey	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
6506B, 6506C---------- Hitt Variant	Fair: low strength, thin layer, area reclaim.	Poor: excess fines, thin layer.	Unsuited: excess fines.	Fair: thin layer.

*See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
21B---------- Pecatonica	Seepage--------	Favorable------	Not needed-----	Erodes easily	Favorable------	Erodes easily.
21C2---------- Pecatonica	Slope, seepage.	Favorable------	Not needed-----	Erodes easily, slope.	Favorable------	Erodes easily.
21D2---------- Pecatonica	Slope, seepage.	Favorable------	Not needed-----	Erodes easily, slope.	Slope----------	Slope, erodes easily.

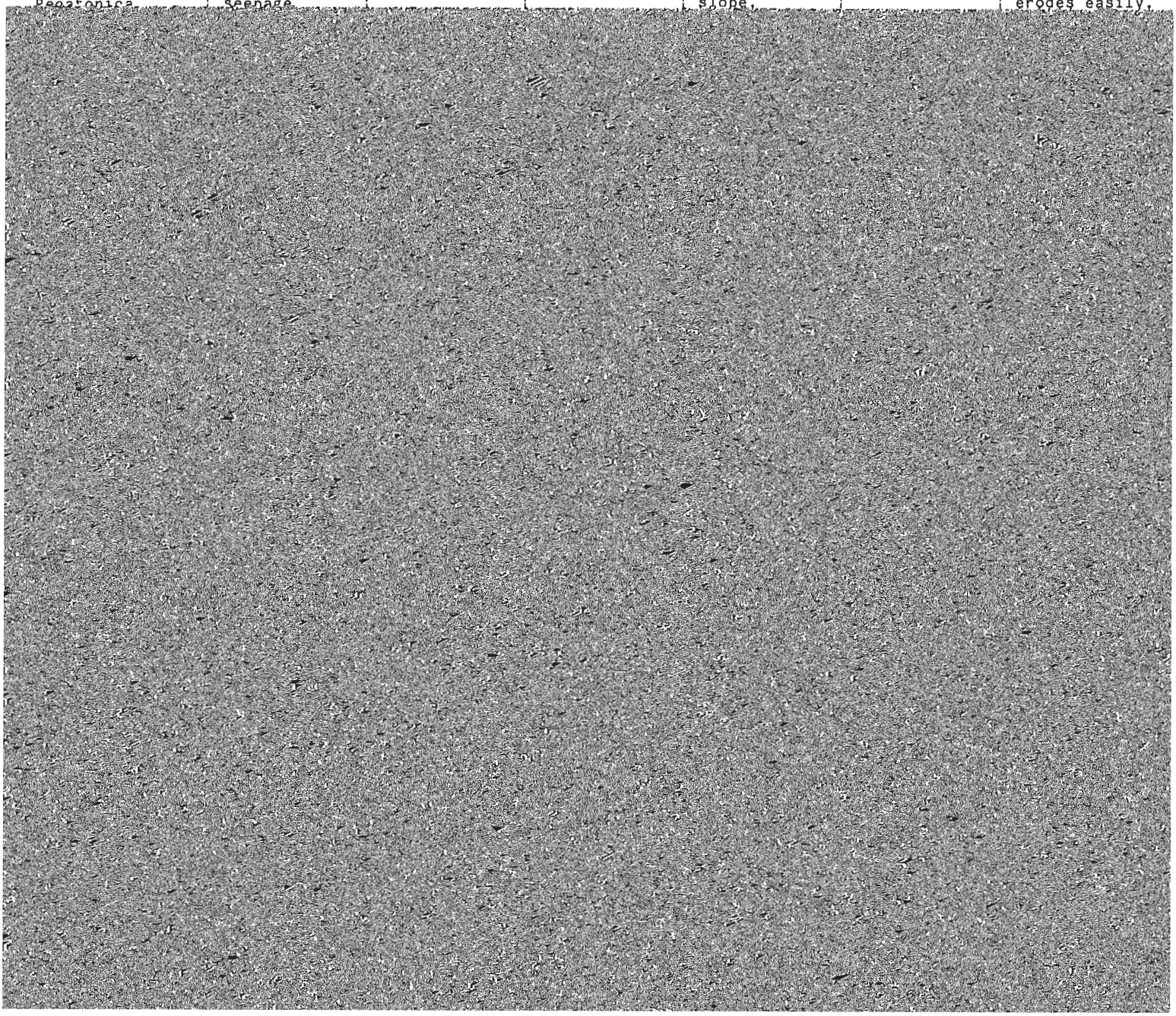


TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
87B---------- Dickinson	Seepage---------	Seepage---------	Not needed-----	Soil blowing---	Soil blowing, too sandy.	Favorable.
87C---------- Dickinson	Slope, seepage.	Seepage---------	Not needed-----	Soil blowing, slope.	Soil blowing, too sandy.	Favorable.
88B---------- Sparta	Seepage---------	Piping, seepage.	Not needed-----	Fast intake, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
102---------- La Hogue	Seepage---------	Wetness---------	Frost action---	Wetness---------	Wetness---------	Wetness.
103---------- Houghton	Seepage---------	Excess humus, wetness.	Frost action, excess humus, floods.	Soil blowing, wetness, floods.	Not needed-----	Wetness.

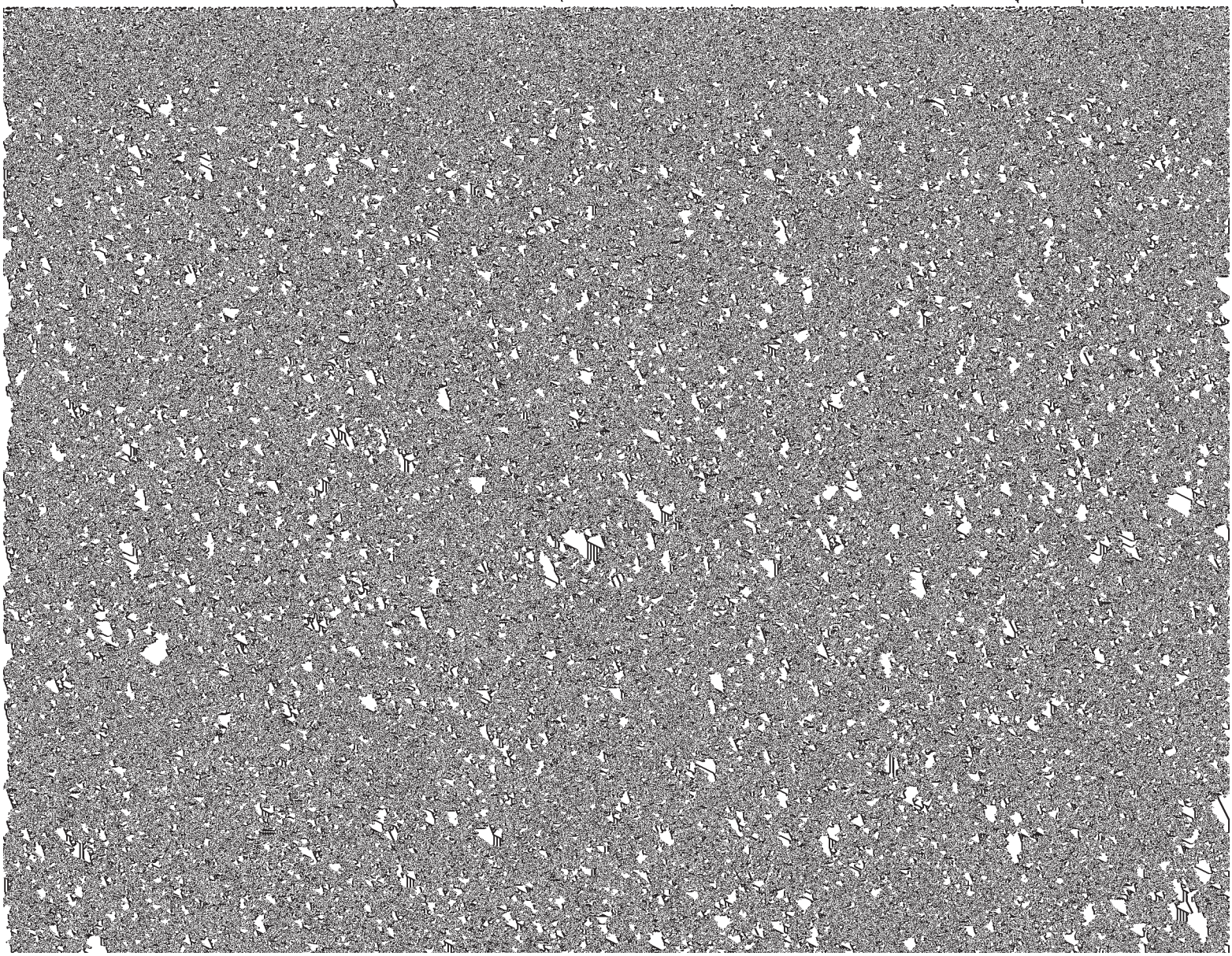


TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
221B---------- Parr	Favorable------	Favorable------	Not needed-----	Favorable------	Favorable------	Favorable.
221C2---------- Parr	Slope----------	Favorable------	Not needed-----	Slope----------	Favorable------	Slope.
223B---------- Varna	Favorable------	Favorable------	Not needed-----	Percs slowly---	Percs slowly---	Percs slowly.
223C2---------- Varna	Slope, seepage.	Favorable------	Not needed-----	Slope, percs slowly.	Percs slowly---	Percs slowly.
233B---------- Birkbeck	Seepage--------	Wetness--------	Frost action---	Erodes easily, wetness.	Wetness--------	Erodes easily.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
347---------- Canisteo	Seepage---------	Wetness---------	Floods, frost action.	Wetness, floods.	Not needed-----	Wetness.
361B---------- Kidder	Seepage---------	Seepage---------	Not needed-----	Favorable------	Favorable------	Favorable.
361C2---------- Kidder	Seepage, slope.	Seepage---------	Not needed-----	Slope----------	Favorable------	Slope.
361D2---------- Kidder	Seepage, slope.	Seepage---------	Not needed-----	Slope----------	Slope----------	Slope.
363B---------- Griswold	Seepage---------	Favorable------	Not needed-----	Favorable------	Favorable------	Favorable.
363C2---------- Griswold	Slope, seepage.	Favorable------	Not needed-----	Slope----------	Favorable------	Favorable.
386A, 386B--------- Downs	Seepage---------	Favorable------	Not needed-----	Favorable------	Erodes easily	Erodes easily.
387A---------- Ockley	Seepage---------	Thin layer-----	Not needed-----	Erodes easily	Not needed-----	Erodes easily.
387B---------- Ockley	Seepage---------	Thin layer-----	Not needed-----	Erodes easily	Favorable------	Erodes easily.
397B---------- Boone	Depth to rock, seepage.	Seepage, thin layer.	Not needed-----	Droughty, fast intake, soil blowing.	Depth to rock, too sandy.	Droughty, depth to rock.
397D---------- Boone	Slope, depth to rock, seepage.	Seepage, thin layer.	Not needed-----	Droughty, fast intake, soil blowing.	Depth to rock, too sandy.	Slope, droughty, depth to rock.
397F---------- Boone	Slope, depth to rock, seepage.	Seepage, thin layer.	Not needed-----	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
398A, 398B--------- Wea	Seepage---------	Favorable------	Not needed-----	Favorable------	Erodes easily	Erodes easily.
410B---------- Woodbine	Depth to rock, seepage.	Thin layer-----	Not needed-----	Erodes easily, percs slowly.	Percs slowly----	Erodes easily, percs slowly.
410C2---------- Woodbine	Slope, depth to rock, seepage.	Thin layer-----	Not needed-----	Erodes easily, percs slowly, slope.	Percs slowly----	Erodes easily, percs slowly.
411B---------- Ashdale	Depth to rock, seepage.	Thin layer-----	Not needed-----	Percs slowly----	Erodes easily, percs slowly.	Erodes easily.
411C2---------- Ashdale	Slope, seepage, depth to rock.	Thin layer-----	Not needed-----	Slope, percs slowly.	Erodes easily, percs slowly.	Erodes easily.
412B----------	Seepage---------	Favorable------	Not needed-----	Favorable------	Erodes easily	Erodes easily.

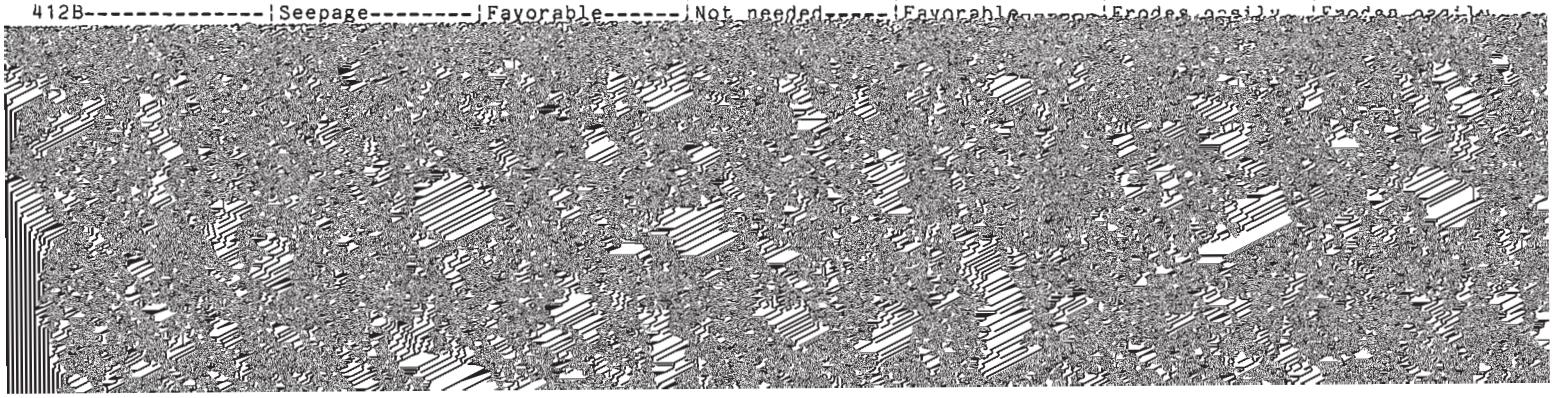


TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
416C2---------- Durand	Slope, seepage.	Favorable------	Not needed-----	Slope----------	Favorable------	Favorable.
419B---------- Flagg	Seepage--------	Favorable------	Not needed-----	Erodes easily	Favorable------	Erodes easily.
419C2---------- Flagg	Slope, seepage.	Favorable------	Not needed-----	Slope, erodes easily.	Favorable------	Erodes easily.
429B----------	Depth to rock,	Thin layer-----	Not needed-----	Percs slowly---	Erodes easily, percs slowly	Erodes easily, percs slowly.

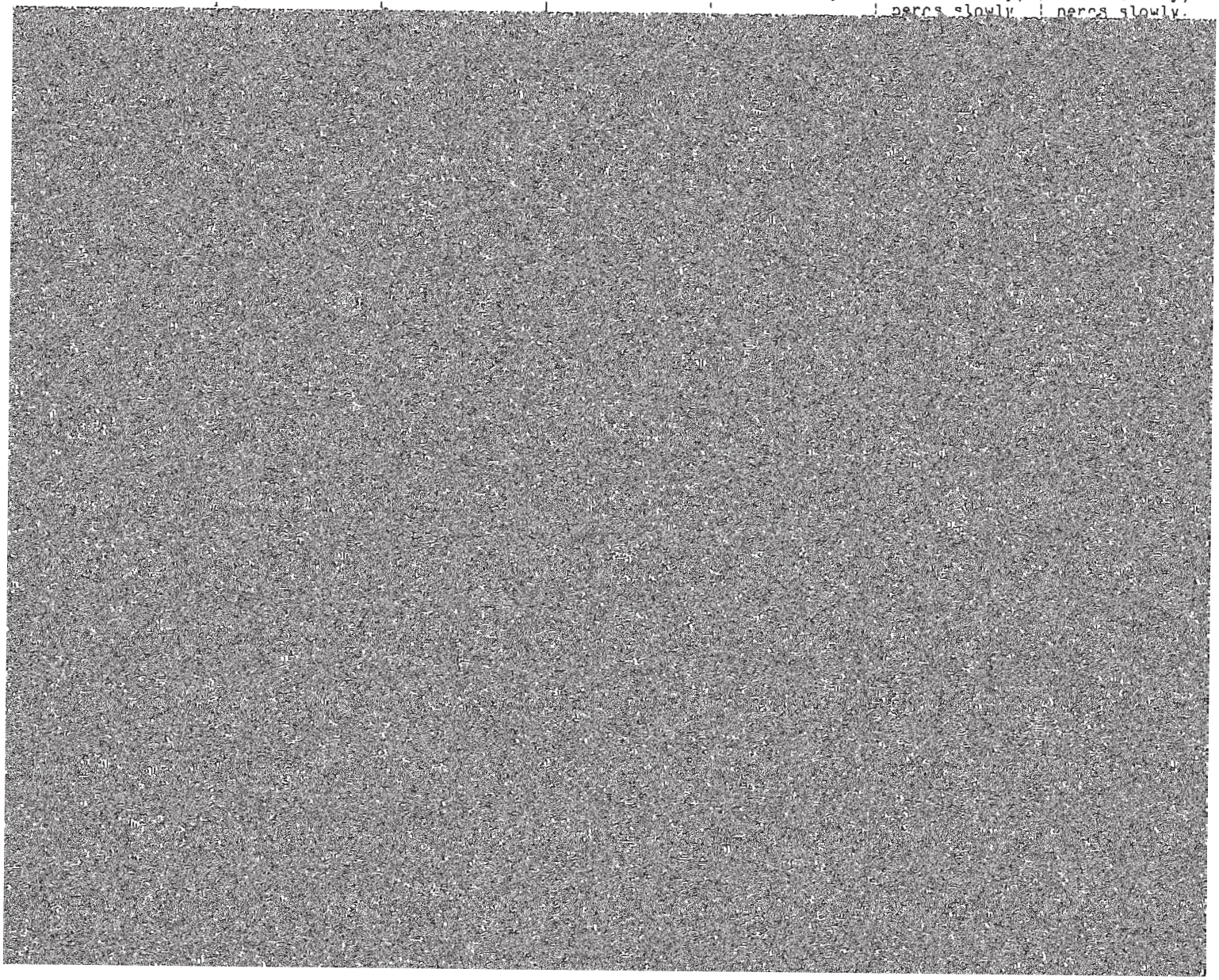


TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
509E2--Whalan	Slope, depth to rock.	Thin layer	Not needed	Slope, rooting depth.	Depth to rock, slope.	Slope, depth to rock.
570A--Martinsville	Seepage	Favorable	Not needed	Favorable	Not needed	Erodes easily.
570B--Martinsville	Seepage	Favorable	Not needed	Favorable	Favorable	Erodes easily.
570C2--Martinsville	Slope, seepage.	Favorable	Not needed	Slope	Favorable	Slope, erodes easily.
570D2--Martinsville	Slope, seepage.	Favorable	Not needed	Slope	Slope	Slope, erodes easily.
661B--Atkinson	Depth to rock	Thin layer	Not needed	Favorable	Favorable	Favorable.
661C2--Atkinson	Slope, depth to rock.	Thin layer	Not needed	Slope	Favorable	Favorable.
727B--Waukee	Seepage	Seepage	Not needed	Favorable	Too sandy	Favorable.
728C2--Winnebago	Seepage, slope.	Favorable	Not needed	Slope	Favorable	Favorable.
742B--Dickinson	Seepage	Seepage, piping.	Not needed	Soil blowing	Too sandy, soil blowing.	Erodes easily.
742C--Dickinson	Seepage, slope.	Seepage, piping.	Not needed	Soil blowing, slope.	Too sandy, soil blowing.	Erodes easily.
761B--Eleva	Depth to rock, seepage.	Thin layer	Not needed	Soil blowing, rooting depth.	Soil blowing, depth to rock.	Depth to rock.
761D--Eleva	Slope, depth to rock, seepage.	Thin layer	Not needed	Slope, soil blowing, rooting depth.	Soil blowing, depth to rock.	Slope, depth to rock.
761F--Eleva	Slope, depth to rock, seepage.	Thin layer	Not needed	Slope, soil blowing, rooting depth.	Slope, soil blowing, depth to rock.	Slope, depth to rock.
776--Comfrey	Seepage	Wetness	Floods, frost action.	Wetness, floods.	Not needed	Wetness.
779B--Chelsea	Seepage	Piping, seepage.	Not needed	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
779D--Chelsea	Slope, seepage.	Piping, seepage.	Not needed	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Slope, droughty.
802*. Orthents						
864*, 865*. Pits						
919C*: Rodman	Slope, seepage.	Seepage	Not needed	Slope, droughty.	Slope, too sandy.	Slope, droughty.
Fox	Seepage, slope.	Seepage	Not needed	Slope	Favorable	Slope.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
919E*:						
Rodman	Slope, seepage.	Seepage	Not needed	Slope, droughty.	Slope, too sandy.	Slope, droughty.
Fox	Seepage, slope.	Seepage	Not needed	Slope	Slope, too sandy.	Slope.
939C*, 939E*:						
Rodman	Slope, seepage.	Seepage	Not needed	Slope, droughty.	Slope, too sandy.	Slope, droughty.
Warsaw	Seepage	Seepage	Not needed	Slope	Too sandy	Slope.
4776 Comfrey	Seepage	Wetness	Floods, frost action.	Wetness, floods.	Not needed	Wetness.
6506B Hitt Variant	Seepage, depth to rock.	Thin layer	Not needed	Soil blowing	Soil blowing	Favorable.
6506C Hitt Variant	Seepage, depth to rock, slope.	Thin layer	Not needed	Soil blowing, slope.	Soil blowing	Favorable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
21B, 21C2, 21D2---- Pecatonica	0-11	Silt loam-------	ML, CL	A-6, A-4	0	100	100	90-100	80-95	25-40	3-15
	11-22	Silty clay loam, loam.	ML, CL	A-6, A-4	0	100	100	90-100	70-90	25-40	3-15
	22-33	Sandy clay loam, clay loam, loam.	CL	A-6, A-7	0-5	90-100	90-100	80-90	60-90	30-45	10-20
	33-60	Sandy loam, loam	SM, SC, CL, ML	A-4, A-2, A-6	0-5	90-100	90-100	60-90	30-70	15-30	3-11
22C2, 22D2---------- Westville	0-9	Silt loam-------	CL-ML, CL	A-6, A-4	0	100	100	90-100	70-90	25-40	4-15
	9-29	Clay loam, sandy clay loam.	CL	A-6, A-7-6	0-5	90-100	90-100	80-90	60-90	30-45	11-19
	29-60	Sandy loam, loam, gravelly sandy loam.	SC, SM-SC, CL, CL-ML	A-4, A-2, A-6	0-5	90-100	90-100	60-90	30-70	15-30	3-11
24B, 24C2---------- Dodge	0-11	Silt loam-------	CL, CL-ML, ML	A-4	0	100	100	90-100	70-95	20-30	3-10
	11-29	Silty clay loam, silt loam.	CL, CH, ML, MH	A-6, A-7	0	100	100	90-100	70-95	35-55	15-25
	29-33	Clay loam, sandy clay loam.	CL, SC	A-6, A-7	0-2	90-100	85-95	75-95	45-60	30-45	15-25
	33-60	Loam------------	ML, CL	A-4	1-5	85-90	85-95	75-95	50-70	15-30	*NP-10
27B, 27C2, 27D2, 27E2---------- Miami	0-8	Loam------------	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	22-34	6-15
	8-34	Clay loam, silty clay loam, sandy clay loam.	CL	A-6, A-7	0	92-99	89-97	78-95	64-95	35-50	17-31
	34-60	Loam, clay loam, sandy loam.	CL, CL-ML, ML	A-4, A-6	0-3	88-94	83-89	74-87	50-64	17-30	2-14
29D2---------- Dubuque	0-6	Silt loam-------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	6-27	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	27-32	Clay------------	CH	A-7	2-10	85-95	80-90	70-85	65-85	50-70	30-45
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
36A, 36B, 36C2----- Tama	0-17	Silt loam-------	ML, OL	A-6, A-7	0	100	100	100	95-100	35-50	10-20
	17-53	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	15-25
	53-68	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
41---------- Muscatine	0-16	Silt loam-------	CL, CL-ML	A-6, A-4	0	100	100	100	95-100	25-40	5-15
	16-50	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	20-30
	50-60	Silt loam-------	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
55B---------- Sidell	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	20-35	5-15
	11-28	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	80-95	35-50	20-30
	28-58	Clay loam, loam, sandy clay loam.	CL	A-6, A-7	0	90-100	85-100	75-90	50-80	35-50	15-30
	58-60	Loam, sandy loam, sandy clay loam.	CL, CL-ML	A-4, A-6	0-2	85-95	80-90	75-85	50-65	20-30	5-15

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
60C2---------- La Rose	0-8	Silt loam-------	ML, CL, OL	A-6, A-7	0	100	95-100	90-100	60-95	30-50	11-20
	8-20	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	95-100	90-100	85-100	60-95	30-50	11-25
	20-60	Loam, clay loam	CL	A-4, A-6	0-5	95-100	90-100	75-100	50-90	25-40	8-20
61---------- Atterberry	0-13	Silt loam-------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-40	5-15
	13-49	Silty clay loam	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-30
	49-60	Silt loam-------	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
68---------- Sable	0-20	Silty clay loam	CL, OH, CH, OL	A-7	0	100	100	98-100	95-100	41-65	15-35
	20-40	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	98-100	95-100	40-55	20-35
	40-60	Silt loam-------	CL	A-6	0	100	100	98-100	95-100	30-40	10-20
73---------- Ross	0-32	Loam------------	ML, CL-ML, CL	A-4, A-6	0	90-100	90-100	80-100	65-95	20-35	NP-12
	32-63	Loam, silt loam	ML, CL	A-6, A-4, A-7	0	90-100	85-100	70-100	55-95	30-45	3-18
74---------- Radford	0-28	Silt loam-------	ML, CL, CL-ML	A-4, A-6	0	100	100	95-100	80-100	30-40	5-15
	28-60	Silty clay loam, clay loam, loam.	CL	A-6	0	100	100	95-100	80-95	35-50	15-25
77---------- Huntsville	0-50	Silt loam, silty clay loam.	CL, ML	A-6, A-7	0	100	98-100	90-100	80-100	35-50	10-25
	50-60	Loam, silt loam, sandy loam.	CL, ML, SM, SC	A-4, A-6	0	90-100	80-100	55-95	45-85	18-37	3-15
82---------- Millington	0-19	Silt loam-------	ML, CL, OL	A-6, A-7, A-4	0	90-100	90-100	80-100	70-95	30-45	8-17
	19-38	Loam, silty clay loam, clay loam.	CL	A-7, A-6	0	95-100	90-100	80-100	70-95	28-50	10-22
	38-61	Stratified loam to loamy sand.	CL, CL-ML, SM-SC	A-6, A-4, A-2	0	95-100	90-100	70-100	25-95	20-40	5-20
87B, 87C---------- Dickinson	0-23	Sandy loam------	SM, SC, SM-SC	A-4, A-2	0	100	100	85-95	30-50	15-30	NP-10
	23-46	Loamy sand,	SM,	A-2, A-3	0	100	100	80-95	5-20	10-20	NP-5

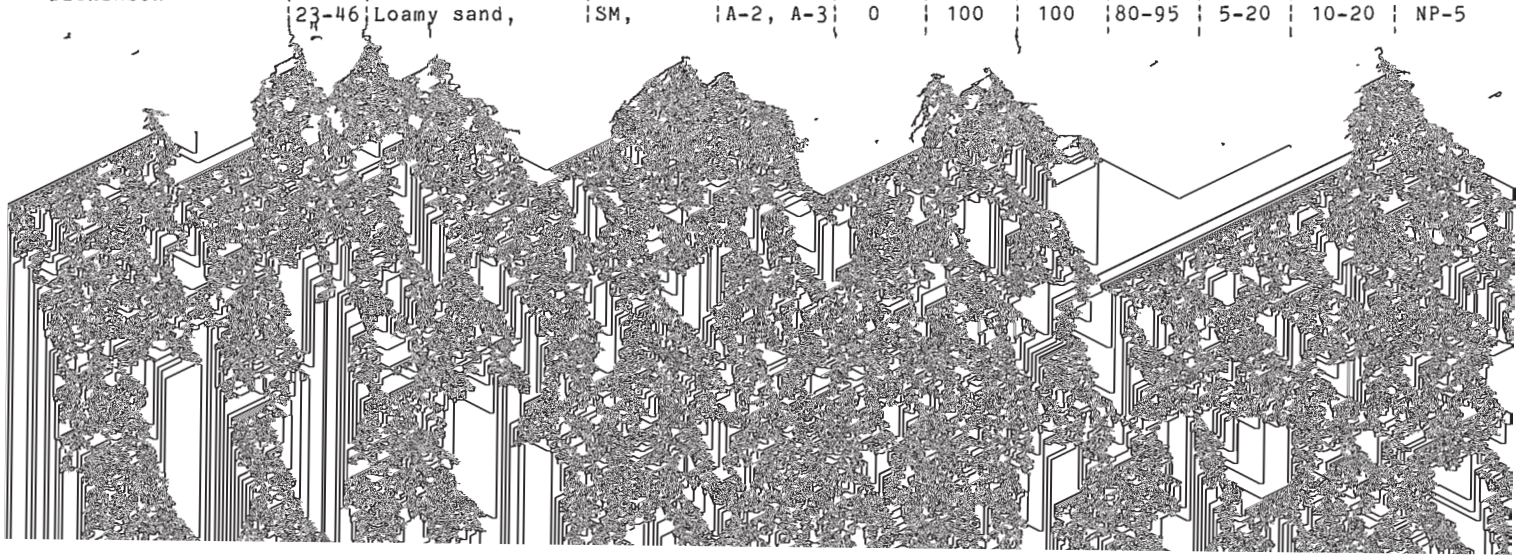


TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
103---------- Houghton	0-60	Sapric material	PT	A-8	0	---	---	---	---	---	---
105B---------- Batavia	0-11	Silt loam-------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	23-38	5-15
	11-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	27-47	12-28
	46-60	Clay loam, sandy loam, silt loam.	CL, SC, SM-SC, CL-ML	A-2, A-4, A-6	0-5	90-100	80-90	60-90	30-70	10-25	4-15
107---------- Sawmill	0-46	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	80-100	30-50	15-30
	46-60	Stratified silty clay loam to loam.	CL	A-6, A-7	0	100	100	95-100	70-100	25-45	10-30
119C2---------- Elco	0-12	Silt loam-------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	12-27	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	27-67	Silty clay loam, loam, clay loam.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30
123**. Riverwash											
125---------- Selma	0-22	Clay loam, loam	SC, CL	A-4, A-6	0	100	98-100	90-100	35-70	25-35	7-17
	22-45	Loam, clay loam, sandy loam.	CL, SC	A-6	0	100	95-100	90-100	38-75	24-36	11-19

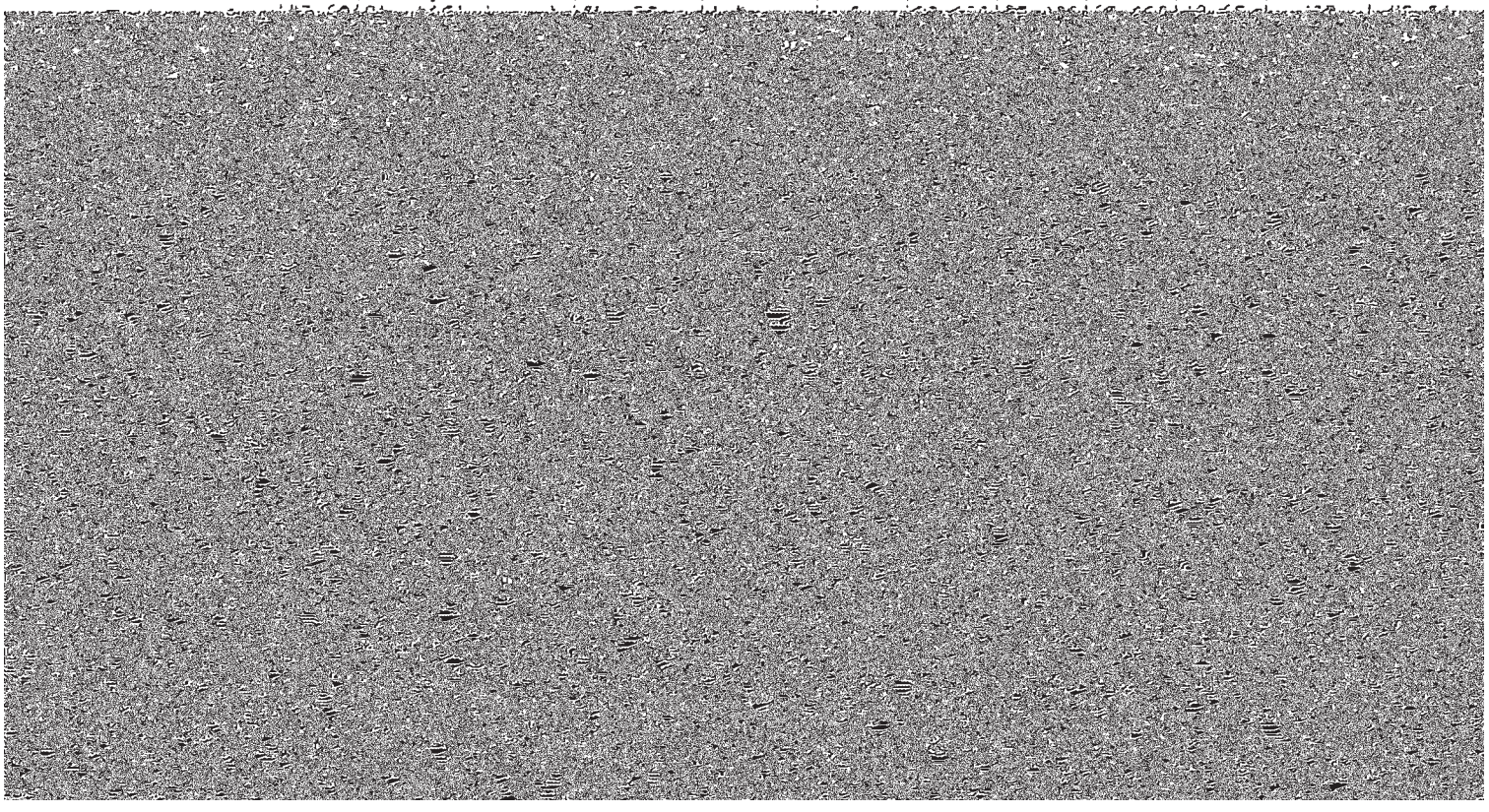


TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
175B, 175C--------- Lamont	0-5	Sandy loam------	SM-SC, SC	A-2, A-4	0	100	100	80-95	25-50	15-25	5-10
	5-31	Sandy loam, loam, sandy clay loam.	SM-SC, SC	A-2, A-4	0	100	100	85-95	30-50	20-30	5-10
	31-60	Loamy sand, sand, sandy loam.	SM, SP-SM	A-2, A-3	0	100	100	70-90	5-25	---	NP
198---------- Elburn	0-21	Silt loam-------	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
	21-51	Silty clay loam	CL	A-6, A-7	0	100	100	100	75-90	30-50	15-35
	51-70	Loam, sandy	CL,	A-6,	0	90-100	80-100	60-90	25-80	20-40	5-20

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
259B, 259C2-------- Assumption	0-9	Silt loam-------	CL	A-6, A-4	0	100	100	95-100	90-100	25-40	8-20
	9-25	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-30
	25-63	Clay loam, silty clay loam.	CL	A-6, A-7	0-5	100	95-100	90-100	70-90	35-50	20-35
278A---------- Stronghurst	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
	11-44	Silty clay loam	CL	A-7	0	100	100	100	98-100	41-50	19-28
	44-66	Silt loam-------	CL, CL-ML	A-6, A-4	0	100	100	98-100	95-100	26-37	5-15
279A---------- Rozetta	0-12	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	24-35	5-15
	12-49	Silty clay loam	CL	A-7	0	100	100	95-100	95-100	41-50	19-28
	49-60	Silt loam-------	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	21-37	6-20
280B, 280C2, 280D2- Fayette	0-11	Silt loam-------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	11-44	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	44-60	Silt loam-------	CL	A-6	0	100	100	100	95-100	30-40	10-20
290B---------- Warsaw	0-16	Loam----------	CL, CL-ML	A-4, A-6	0	80-100	75-100	70-100	50-90	25-35	4-12
	16-33	Sandy clay loam	SC, CL	A-6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

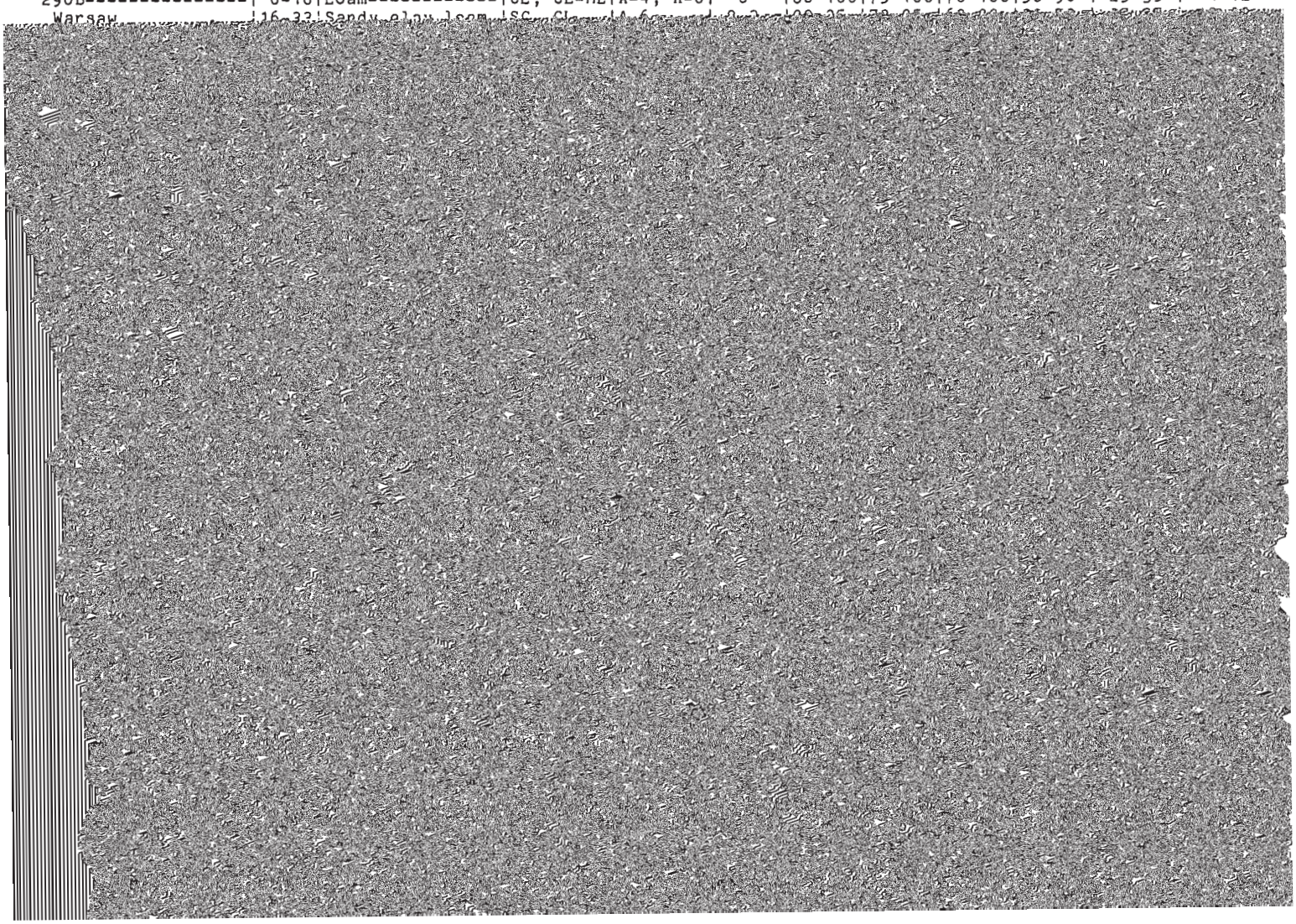


TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
347---------- Canisteo	0-19	Clay loam-------	ML	A-7	0	95-100	95-100	85-100	60-90	40-50	15-20
	19-40	Silty clay loam, loam.	CL	A-6, A-7	0	95-100	90-100	85-95	65-85	35-50	15-25
	40-62	Clay loam, loam	CL	A-6	0-5	95-100	90-100	80-95	60-75	30-40	12-20
361B, 361C2, 361D2--- Kidder	0-5	Loam----------	ML, CL-ML, CL	A-4	0	95-100	95-100	85-100	60-90	20-30	3-10
	5-36	Clay loam, gravelly clay loam, loam.	CL, SC	A-6, A-4	0-5	75-100	75-100	65-95	45-70	25-40	8-15
	36-60	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, GM	A-2, A-4	3-10	50-90	50-90	50-80	15-45	---	NP
363B, 363C2-------- Griswold	0-14	Loam----------	CL-ML, CL	A-4, A-6	0	95-100	95-100	90-100	70-90	20-30	5-15
	14-28	Loam, sandy clay loam, clay loam.	CL-ML, CL, SM-SC, SC	A-6, A-4	0-5	95-100	90-100	80-90	45-80	20-35	5-15
	28-34	Sandy loam------	SM, SC, SM-SC	A-2, A-4	0-10	85-95	65-85	50-75	20-45	<25	3-10
	34-60	Sandy loam, gravelly sandy loam.	SM, SC, SM-SC	A-2, A-4	0-10	85-95	65-85	50-75	20-45	<25	3-10
386A, 386B--------- Downs	0-7	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	7-47	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	100	95-100	35-45	15-25
	47-60	Silt loam-------	CL	A-6	0	100	100	100	95-100	30-40	10-20
387A, 387B--------- Ockley	0-9	Silt loam-------	CL, ML, CL-ML	A-4, A-6	0	100	95-100	80-100	60-90	22-33	3-12
	9-31	Silty clay loam, clay loam.	CL	A-6, A-7	0	100	75-100	65-90	50-90	35-50	15-30
	31-55	Gravelly clay loam, clay loam.	CL, SC, GC	A-6, A-7	0-2	70-85	45-75	40-70	35-55	30-50	15-30
	55-60	Stratified sand to gravelly sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	20-55	5-20	2-10	---	NP
397B, 397D, 397F--- Boone	0-2	Sand----------	SM, SP-SM	A-2, A-3	0	100	100	65-80	5-35	---	NP
	2-34	Fine sand, sand	SM, SP-SM	A-2, A-3	0	100	100	50-75	5-30	---	NP
	34-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
398A, 398B--------- Wea	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	11-45	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	95-100	90-95	85-95	65-90	35-50	15-30
	45-57	Gravelly loamy sand.	CL, SM-SC, SC, CL-ML	A-4, A-6, A-2	0-5	70-85	65-85	60-80	20-65	15-30	5-15
	57-60	Stratified sand to gravelly sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	20-55	5-20	0-10	---	NP

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
410B, 410C2-------- Woodbine	0-5	Silt loam--------	CL-ML, CL	A-6, A-4	0	100	100	95-100	80-100	25-35	6-15
	5-18	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	35-45	16-26
	18-41	Clay loam, sandy clay loam, sandy loam.	CL-ML, CL, SM-SC, SC	A-4, A-6, A-2	0-5	90-100	90-100	60-90	30-80	15-35	4-19
	41-47	Silty clay, cherty clay, clay.	CH, CL	A-7	0-10	75-100	75-100	70-95	60-90	40-60	20-35
	47	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
411B, 411C2-------- Ashdale	0-17	Silt loam--------	CL	A-4, A-6	0	100	100	100	95-100	30-40	8-18
	17-48	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-50	15-30
	48-50	Silty clay, clay	CH	A-7	0-5	90-100	90-100	90-95	65-90	50-70	30-45
	50	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
412B, 412C2-------- Ogle	0-11	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
	11-43	Silty clay loam, silt loam.	CL	A-7	0	100	95-100	95-100	90-100	40-50	20-30
	43-65	Clay loam, loam, sandy clay loam.	CL	A-6, A-7	0	95-100	90-100	85-100	60-95	25-50	10-30
414B--------------- Myrtle	0-7	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	28-40	8-20
	7-32	Silty clay loam	CL	A-6, A-7	0	100	95-100	95-100	90-100	35-50	15-30
	32-60	Loam, clay loam, sandy clay loam.	CL	A-6, A-7	0-5	95-100	90-100	85-100	60-95	25-45	11-25
415---------------- Orion	0-27	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	20-30	5-15
	27-59	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	85-100	85-100	20-30	5-15
	59-69	Silt loam, loam	CL, CL-ML	A-4, A-6	0	80-100	80-100	80-100	80-100	20-30	5-15
416B, 416C2-------- Durand	0-13	Silt loam--------	ML, CL	A-6, A-4	0	100	100	90-100	80-100	25-40	3-15
	13-20	Silty clay loam, silt loam.	CL	A-6	0	100	100	90-100	70-95	25-40	10-20
	20-60	Clay loam, loam, gravelly sandy clay loam.	CL, SC	A-6, A-7, A-2	0-5	90-100	70-100	65-90	30-70	30-45	10-20
419B, 419C2-------- Flagg	0-10	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	30-40	8-15
	10-40	Silty clay loam	CL	A-6, A-7	0	100	95-100	95-100	90-100	35-50	15-30
	40-60	Clay loam, sandy clay loam, silty clay loam.	CL	A-6	0	95-100	90-100	85-100	60-95	25-40	11-25
429B, 429C2-------- Palsgrove	0-10	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	23-35	5-14
	10-48	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	36-46	17-27
	48-59	Clay------------	CH	A-7	0-5	90-95	90-95	90-95	65-90	50-70	30-45
	59	Weathered bedrock.	---	---	---	---	---	---	---	---	---
440A, 440B, 440C2-- Jasper	0-22	Loam, silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	22-37	Sandy clay loam	SC, CL	A-6	0	100	100	80-95	45-85	20-35	10-20

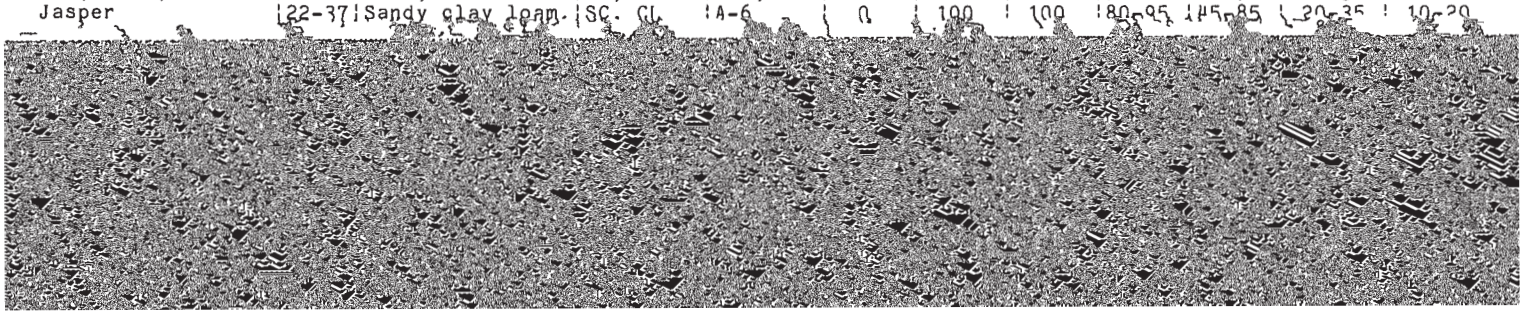


TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
451---------- Lawson	0-59	Silt loam-------	CL, CL-ML	A-4	0	100	100	90-100	80-100	20-30	5-10
	59-75	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	90-100	80-100	35-50	15-30
490---------- Odell	0-13	Loam----------	ML, CL	A-4, A-6	0	100	100	90-100	70-95	30-40	8-14
	13-25	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	90-100	90-95	80-90	65-75	35-50	17-31
	25-60	Loam, clay loam	CL, ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	25-40	2-16
503B, 503C2-------- Rockton	0-22	Silt loam-------	ML, CL-ML, CL	A-4	0	90-100	90-100	85-95	50-75	25-35	5-10
	22-29	Loam, sandy clay loam, clay loam.	CL, SC	A-6, A-7	0	90-100	90-100	75-90	45-70	30-45	10-20
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
504D, 504F--------- Sogn	0-10	Loam----------	CL	A-6, A-7	0-10	85-100	85-100	85-100	80-95	25-45	11-23
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
505C2, 505E2------- Dunbarton	0-5	Silty clay loam	CL	A-6	0-10	70-100	70-100	70-100	70-95	25-40	11-20
	5-10	Silty clay loam	CL	A-6	0-10	70-100	70-100	70-100	70-95	25-40	11-20
	10-16	Clay, silty clay, silty clay loam.	CH	A-7	0-10	70-100	70-100	70-100	70-95	50-61	24-35
	16	Weathered bedrock.	---	---	---	---	---	---	---	---	---
509B, 509C2, 509D2, 509E2---------- Whalan	0-7	Loam----------	ML	A-4	0	100	95-100	85-95	60-90	30-40	5-10
	7-25	Clay loam, loam	CL	A-6	0	95-100	95-100	80-95	70-90	30-40	10-15
	25-29	Clay loam, clay, silty clay.	CL, CH	A-7	0-5	80-100	70-95	65-90	50-85	40-60	20-35
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
570A, 570B, 570C2, 570D2---------- Martinsville	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	90-100	80-100	60-90	22-33	4-12
	11-26	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	100	90-100	65-90	40-90	20-35	8-20
	26-47	Sandy loam, sandy clay loam, loam.	SM, ML	A-2-4, A-4	0	100	90-100	60-80	30-60	30-40	2-8
	47-60	Stratified silty clay loam to sandy loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0	95-100	85-100	80-95	40-85	<25	4-15
661B, 661C2-------- Atkinson	0-14	Silt loam-------	CL	A-6	0	100	95-100	85-95	55-75	25-35	10-20
	14-39	Silt loam, clay loam, sandy clay loam.	CL	A-6	2-5	90-95	80-95	80-90	50-65	30-40	10-20
	39-43	Silty clay------	CH	A-7	2-10	85-95	80-95	80-90	70-90	55-70	30-45
	43	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
727B---------- Waukee	0-15	Loam----------	CL	A-6	0	100	90-100	70-90	50-75	30-40	10-20
	15-30	Loam, sandy clay loam.	CL, SM-SC, SC, CL-ML	A-6, A-4	0-5	85-95	80-95	65-85	40-60	20-35	5-15
	30-60	Gravelly sand, loamy sand.	SW, SM, SP-SM, SP	A-1	2-10	60-90	60-85	20-40	3-25	---	NP
728C2---------- Winnebago	0-9	Silt loam-------	ML, CL	A-6, A-4	0	100	95-100	95-100	90-100	30-40	5-15
	9-68	Clay loam, sandy clay loam, gravelly clay loam.	SC, CL	A-6, A-2	0-5	70-95	60-90	45-80	30-60	28-40	12-22
742B, 742C---------- Dickinson	0-20	Sandy loam------	SM, SC, SM-SC	A-2, A-4	0	100	100	80-95	30-50	15-30	NP-10
	20-50	Fine sandy loam, sandy loam, loamy sand.	SM, SP, SM-SC	A-2, A-3	0	100	100	80-95	3-20	10-20	NP-5
	50-63	Loam----------	CL	A-6	2-5	90-95	85-95	80-90	55-65	25-35	11-20
761B, 761D, 761F--- Eleva	0-7	Sandy loam------	SM, SM-SC	A-2, A-4	0	100	95-100	60-90	25-50	<20	2-7
	7-21	Loam, sandy loam, fine sandy loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0	100	90-100	60-95	25-65	<25	NP-7
	21-35	Sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	80-100	50-85	5-35	<20	NP-4
	35	Weathered bedrock.	---	---	---	---	---	---	---	---	---
776---------- Comfrey	0-35	Clay loam, loam	OL, OH, MH, ML	A-7	0	100	100	85-98	65-85	45-60	12-20
	35-60	Clay loam, loam	CL	A-7, A-6	0	100	100	80-98	60-85	35-50	12-25
779B, 779D---------- Chelsea	0-3	Loamy sand------	SM, SP-SM	A-2-4	0	100	100	65-80	10-35	---	NP
	3-60	Fine sand, sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	100	100	65-80	3-15	---	NP
802**. Orthents											
864**, 865**. Pits											
919C**, 919E**: Rodman----------	0-8	Gravelly loam---	ML, CL,	A-4	0-2	70-85	65-85	60-80	36-65	<30	3-9

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
939C**, 939E**:											
Rodman	0-8	Gravelly loam	ML, CL, SM, SC	A-4	0-2	70-85	65-85	60-80	36-65	<30	3-9
	8-60	Stratified gravelly coarse sand to very gravelly loamy coarse sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	22-55	7-20	2-15	<25	NP-4
Warsaw	0-14	Loam	CL, CL-ML	A-4, A-6	0	80-100	75-100	70-100	50-90	25-35	4-12
	14-24	Sandy clay loam, loam, gravelly clay loam.	SC, CL	A-6, A-2-6	0-3	90-95	70-95	60-90	30-70	25-35	10-20
	24-32	Gravelly sandy clay loam, gravelly loam.	CL, SC, GC	A-6, A-2-6	0-5	70-90	60-85	55-70	30-60	25-35	10-15
	32-60	Stratified sand to very gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	1-5	30-70	22-55	7-20	2-10	<20	NP
4776 Comfrey	0-35	Clay loam	OL, OH, MH, ML	A-7	0	100	100	85-98	65-85	45-60	12-20
	35-60	Stratified loam	CL	A-7, A-6	0	100	100	80-98	60-85	35-50	12-25

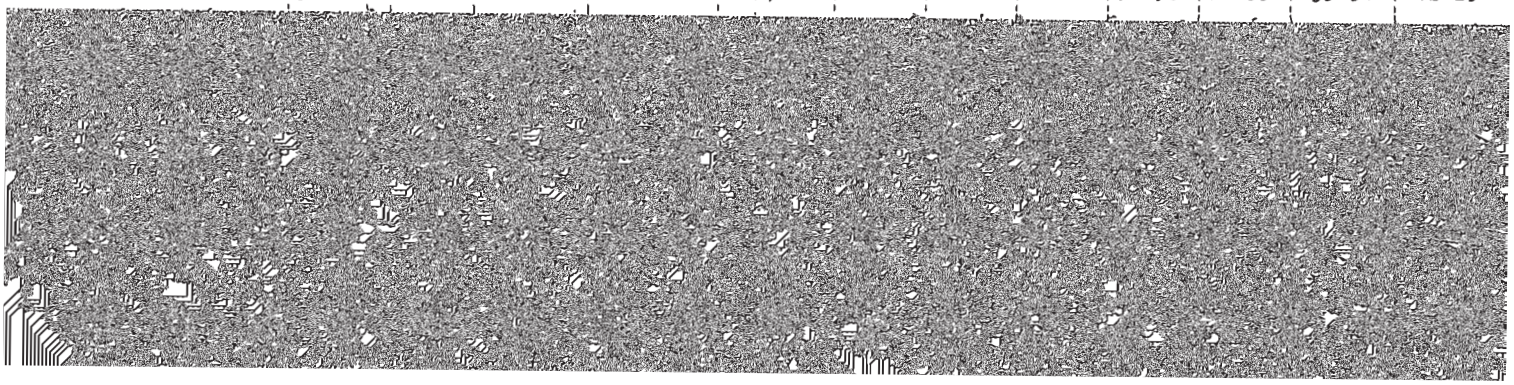


TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
						K	T	
	In	In/hr	In/in	pH				Pct
21B, 21C2, 21D2--	0-11	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	4-3	1-3
Pecatonica	11-22	0.6-2.0	0.17-0.22	4.5-6.5	Low----------	0.37		
	22-33	0.6-2.0	0.15-0.19	4.5-6.5	Moderate-------	0.37		
	33-60	0.6-2.0	0.07-0.15	4.5-8.4	Low----------	0.28		
22C2, 22D2-------	0-9	0.6-2.0	0.20-0.24	5.1-6.5	Low----------	0.37	5	1-3
Westville	9-29	0.6-2.0	0.15-0.19	5.1-7.3	Moderate-------	0.37		
	29-60	0.6-2.0	0.07-0.15	6.6-8.4	Low----------	0.28		
24B, 24C2--------	0-11	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	1-3
Dodge	11-29	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-------	0.37		
	29-33	0.6-2.0	0.16-0.19	5.1-6.5	Moderate-------	0.37		
	33-60	0.6-2.0	0.07-0.20	7.9-8.4	Low----------	0.37		
27B, 27C2, 27D2, 27E2----------	0-8	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	1-2
Miami	8-34	0.6-2.0	0.15-0.20	5.6-7.3	Moderate-------	0.37		
	34-60	0.6-2.0	0.05-0.19	6.6-8.4	Low----------	0.37		
29D2----------	0-6	0.6-2.0	0.20-0.22	5.6-6.5	Low----------	0.37	4	1-3
Dubuque	6-27	0.6-2.0	0.18-0.20	5.6-6.0	Moderate-------	0.37		
	27-32	0.06-0.2	0.12-0.15	5.6-6.0	High----------	0.37		
	32	---	---	---	----------	---		
36A, 36B, 36C2---	0-17	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-------	0.32	5	2-5
Tama	17-53	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-------	0.43		
	53-68	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-------	0.43		
41----------	0-16	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-------	0.28	5	5-6
Muscatine	16-50	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-------	0.43		
	50-60	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-------	0.43		
55B----------	0-11	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	3-4
Sidell	11-28	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-------	0.43		
	28-58	0.6-2.0	0.15-0.19	5.6-7.8	Moderate-------	0.43		
	58-60	0.6-2.0	0.05-0.19	7.4-8.4	Low----------	0.43		
60C2----------	0-8	0.6-2.0	0.20-0.24	6.1-7.3	Low----------	0.32	5	2-4
La Rose	8-20	0.6-2.0	0.15-0.20	5.6-7.8	Low----------	0.32		
	20-60	0.6-2.0	0.07-0.09	7.4-8.4	Low----------	0.32		
61----------	0-13	0.6-2.0	0.22-0.24	5.6-6.5	Low----------	0.32	5	2-4
Atterberry	13-49	0.2-2.0	0.18-0.20	5.1-6.0	Moderate-------	0.43		
	49-60	0.6-2.0	0.20-0.22	6.1-7.8	Low----------	0.43		
68----------	0-20	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-------	0.28	5	5-6
Sable	20-40	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-------	0.28		
	40-60	0.6-2.0	0.20-0.22	6.6-7.8	Low----------	0.28		
73----------	0-32	0.6-2.0	0.19-0.24	6.1-7.8	Low----------	0.24	5	3-5
Ross	32-63	0.6-2.0	0.16-0.22	6.1-7.8	Low----------	0.24		
74----------	0-28	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	2-3
Radford	28-60	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-------	0.28		
77----------	0-50	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-------	0.28	5	3-4
Huntsville	50-60	0.6-2.0	0.12-0.21	6.1-7.8	Low----------	0.28		
82----------	0-19	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.28	5	4-6
Millington	19-38	0.6-2.0	0.17-0.20	7.4-8.4	Moderate-------	0.28		
	38-61	0.6-2.0	0.14-0.20	7.4-8.4	Low----------	0.28		
87B, 87C----------	0-23	2.0-6.0	0.12-0.15	5.1-7.3	Low----------	0.20	4	1-3
Dickinson	23-46	6.0-20	0.08-0.10	5.6-6.5	Low----------	0.20		
	46-60	6.0-20	0.02-0.04	5.1-6.5	Low----------	0.15		

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
						K	T	
	In	In/hr	In/in	pH				Pct

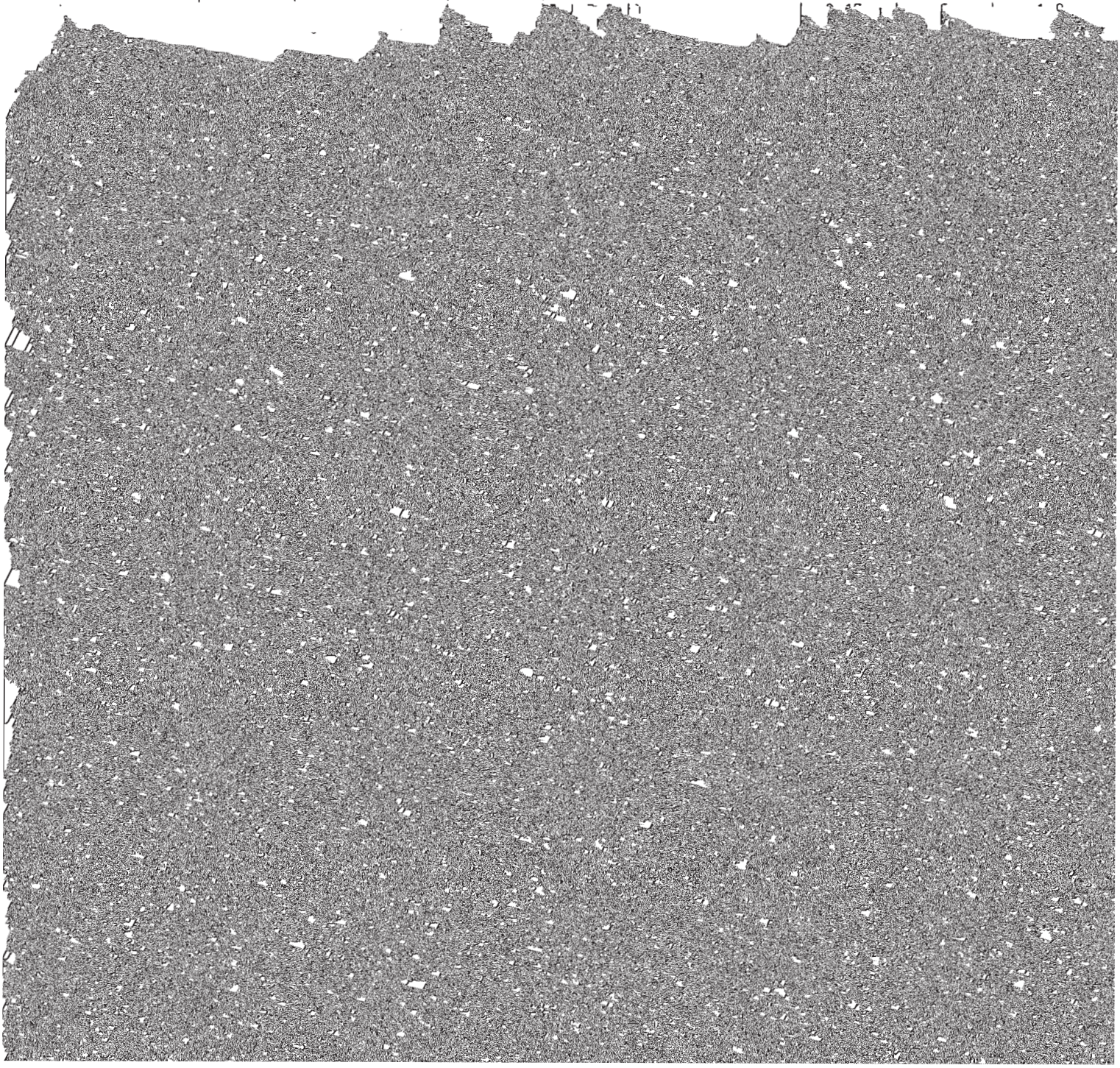


TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
						K	T	
	In	In/hr	In/in	pH				Pct
219----------	0-12	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	2-4
Millbrook	12-33	0.2-2.0	0.15-0.20	5.6-7.3	Moderate-------	0.43		
	33-64	0.2-2.0	0.11-0.22	6.1-8.4	Low----------	0.32		
221B, 221C2------	0-12	0.6-2.0	0.21-0.24	5.6-6.0	Low----------	0.32	5-4	2-4
Parr	12-29	0.6-2.0	0.15-0.19	5.6-6.5	Moderate-------	0.32		
	29-60	0.6-2.0	0.05-0.19	7.4-8.4	Low----------	0.32		
223B, 223C2------	0-14	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	4-3	3-4
Varna	14-40	0.2-0.6	0.09-0.19	5.6-7.3	Moderate-------	0.32		
	40-60	0.06-0.2	0.14-0.20	6.6-8.4	Low----------	0.32		
233B, 233C2------	0-11	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	5	1-3
Birkbeck	11-44	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-------	0.37		
	44-60	0.6-2.0	0.14-0.20	5.6-7.8	Low----------	0.37		
242A----------	0-10	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.37	5	1-3
Kendall	10-43	0.6-2.0	0.18-0.20	5.1-6.5	Moderate-------	0.37		
	43-61	0.6-2.0	0.11-0.22	6.6-8.4	Low----------	0.37		
243A, 243B, 243C2----------	0-13	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5-4	1-3
St. Charles	13-46	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-------	0.37		
	46-60	0.6-2.0	0.11-0.22	5.1-7.8	Low----------	0.37		
259B, 259C2------	0-9	0.6-2.0	0.22-0.24	5.6-6.5	Low----------	0.32	4-3	3-4
Assumption	9-25	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-------	0.43		
	25-63	0.2-0.6	0.14-0.20	5.1-6.5	Moderate-------	0.43		
278A----------	0-11	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	1-3
Stronghurst	11-44	0.2-2.0	0.18-0.20	5.1-6.0	Moderate-------	0.37		
	44-66	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37		
279A----------	0-12	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	1-2
Rozetta	12-49	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-------	0.37		
	49-60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37		
280B, 280C2, 280D2	0-11	0.6-2.0	0.20-0.22	5.1-7.3				

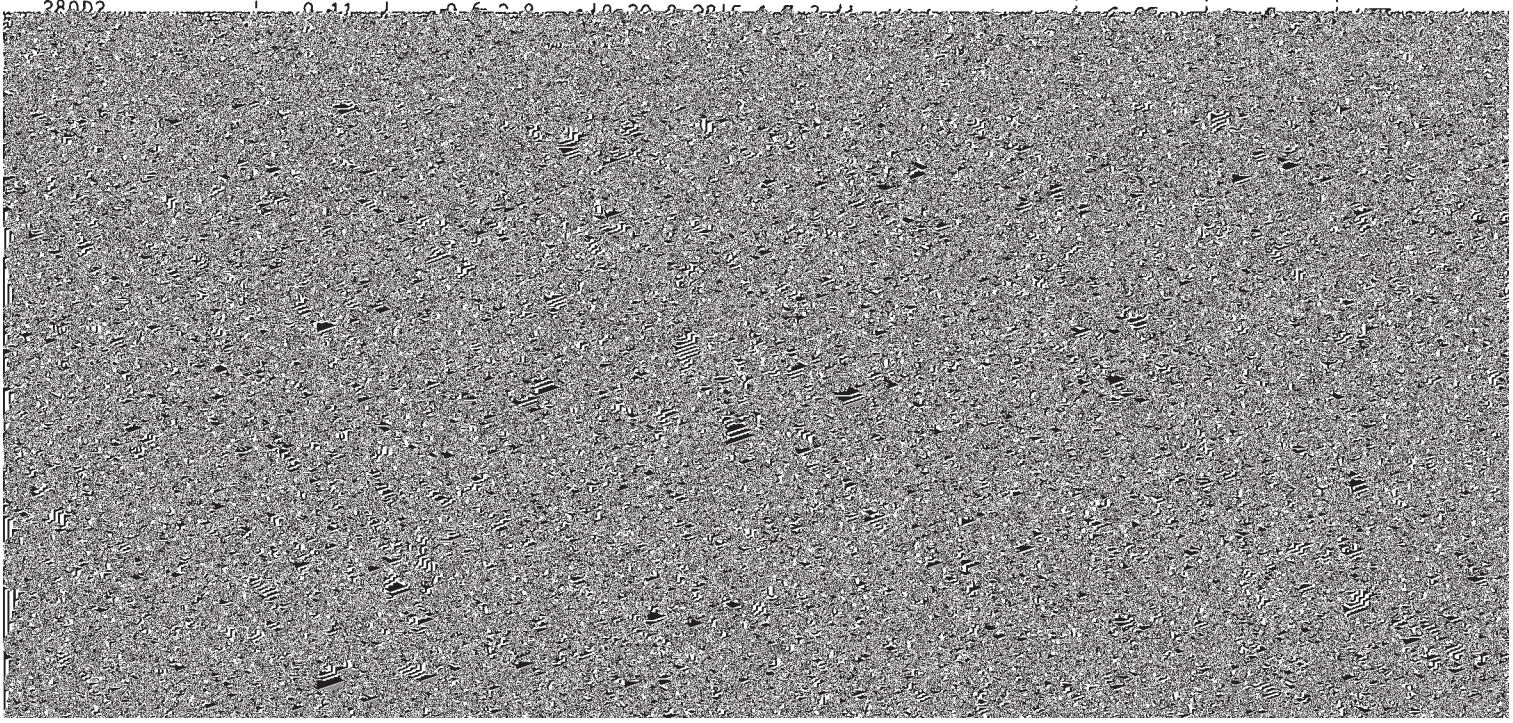


TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

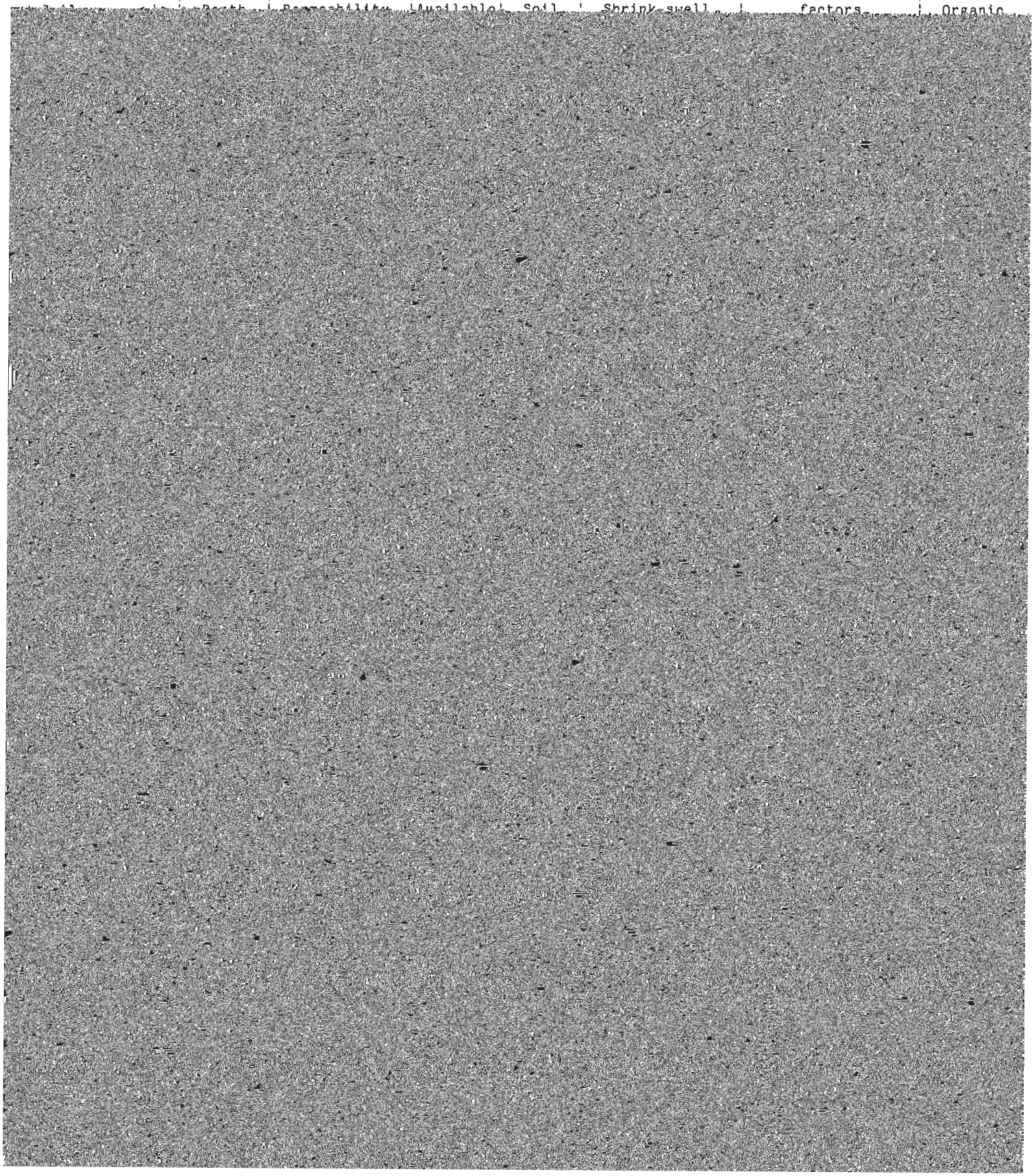


TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
						K	T	
	In	In/hr	In/in	pH				Pct
451----------	0-59	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	3-5
Lawson	59-75	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-------	0.28		
490----------	0-13	0.6-2.0	0.21-0.24	5.6-7.3	Low----------	0.32	5-4	4-5
Odell	13-25	0.2-0.6	0.15-0.19	5.6-6.5	Moderate-------	0.32		
	25-60	0.2-0.6	0.05-0.19	6.6-8.4	Low----------	0.32		
503B, 503C2------	0-22	0.6-2.0	0.20-0.22	5.1-6.5	Low----------	0.28	4	2-6
Rockton	22-29	0.6-2.0	0.17-0.19	5.1-6.5	Moderate-------	0.28		
	29	---	---	---	---	---		
504D, 504F-------	0-10	0.6-2.0	0.17-0.22	6.1-8.4	Moderate-------	0.28	1	2-4
Sogn	10	---	---	---	---	---		
505C2, 505E2-----	0-5	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-------	0.37	2	1-2
Dunbarton	5-10	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-------	0.37		
	10-16	0.2-0.6	0.09-0.13	5.6-7.8	High----------	0.37		
	16	---	---	---	---	---		
509B, 509C2, 509D2, 509E2----	0-7	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	4	1-2
Whalan	7-25	0.6-2.0	0.17-0.19	5.1-6.5	Low----------	0.32		
	25-29	0.06-0.2	0.15-0.19	5.6-7.8	High----------	0.32		
	29	---	---	---	---	---		
570A, 570B, 570C2, 570D2----	0-11	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	1-2
Martinsville	11-26	0.6-2.0	0.17-0.20	5.1-6.0	Moderate-------	0.37		
	26-47	0.6-2.0	0.12-0.14	5.6-6.5	Low----------	0.24		
	47-60	0.6-2.0	0.19-0.21	7.4-8.4	Low----------	0.24		
661B, 661C2------	0-14	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.28	4	3-4
Atkinson	14-39	0.6-2.0	0.17-0.19	5.6-6.0	Low----------	0.28		
	39-43	0.06-0.2	0.12-0.15	6.6-7.3	High----------	0.28		
	43	---	---	---	---	---		
727B----------	0-15	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.24	4	3-4
Waukee	15-30	0.6-2.0	0.15-0.19	5.1-6.0	Low----------	0.32		
	30-60	>20	0.02-0.06	5.1-6.0	Low----------	0.10		
728C2----------	0-9	0.6-2.0	0.15-0.22	5.1-6.5	Low----------	0.32	5	3-4
Winnebago	9-68	0.6-2.0	0.15-0.19	5.1-6.0	Moderate-------	0.32		
742B, 742C-------	0-20	2.0-6.0	0.12-0.15	5.6-6.5	Low----------	0.20	4	1-2
Dickinson	20-50	6.0-20	0.08-0.10	5.1-6.0	Low----------	0.20		
	50-63	0.6-2.0	0.17-0.19	5.6-6.5	Low----------	0.37		
761B, 761D, 761F-	0-7	2.0-6.0	0.13-0.18	5.1-7.3	Low----------	0.24	4	1-3
Eleva	7-21	2.0-6.0	0.12-0.19	5.1-6.5	Low----------	0.24		

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
						K	T	
	In	In/hr	In/in	pH				Pct
919C*, 919E*:								
Fox	0-5	0.6-2.0	0.20-0.24	5.1-7.3	Low	0.32	4	1-3
	5-33	0.6-2.0	0.15-0.19	5.6-7.8	Moderate	0.32		
	33-60	>6.0	0.02-0.04	7.9-8.4	Low	0.10		
939C*, 939E*:								
Rodman	0-8	2.0-6.0	0.10-0.12	6.6-7.8	Low	0.20	3	2-4
	8-60	>20	0.02-0.04	7.4-8.4	Low	0.10		
Warsaw	0-14	0.6-2.0	0.20-0.24	5.6-7.3	Low	0.28	4-3	2-4
	14-24	0.6-2.0	0.16-0.19	5.1-7.8	Low	0.28		
	24-32	0.6-2.0	0.15-0.17	6.6-8.4	Low	0.28		
	32-60	>20	0.02-0.04	7.9-8.4	Low	0.10		
4776	0-35	0.6-2.0	0.18-0.22	6.6-7.8	Moderate	0.28	5	6-10
Comfrey	35-60	0.6-2.0	0.15-0.19	6.6-8.4	Moderate	0.28		
6506B, 6506C	0-15	2.0-6.0	0.13-0.18	5.6-6.5	Low	0.20	4	2-3
Hitt Variant	15-31	2.0-6.0	0.12-0.17	5.1-6.5	Low	0.20		
	31-40	0.6-2.0	0.15-0.19	5.1-6.0	Moderate	0.32		
	40-44	0.06-0.2	0.08-0.12	5.6-7.3	Moderate	0.32		
	44-60							

* See description of the map unit for composition and behavior characteristics of the map unit.

"brief," "apparent," and "perched."
he feature is not a concern]

rock		Risk of corrosion	
Hardness	Potential frost action	Uncoated steel	Concrete
---	Moderate	Moderate	Moderate.
---	Moderate	Moderate	Moderate.
---	High-----	Moderate	Moderate.
---	Moderate	Moderate	Moderate.
Hard	High-----	Moderate	Moderate.
---	High-----	Moderate	Moderate.
---	High-----	High-----	Moderate.
---	High-----	Moderate	Moderate.
---	Moderate	Moderate	Moderate.
---	High-----	High-----	Moderate.
---	High-----	High-----	Low.
---	Moderate	Low------	Low.
---	High-----	High-----	Low.
---	High-----	Low------	Low.
---	High-----	High-----	Low.
---	Moderate	Low------	Moderate.
---	Low------	Low------	Moderate.

TABLE 16.--SOIL AND WATER FEATURES--Continued

me and mbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
---------	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
3, 243C2-les	B	None--------	---	---	3.0-6.0	Apparent	Feb-Jun	>60	---	High-----	Moderate	Moderate.
32------- on	B	None--------	---	---	3.0-4.5	Perched	Feb-May	>60	---	High-----	High-----	Moderate.
--------- st	B	None--------	---	---	1.0-3.0	Apparent	Apr-Jun	>60	---	High-----	High-----	Moderate.
---------	B	None--------	---	---	3.0-4.0	Apparent	Apr-Jun	>60	---	High-----	Moderate	Moderate.
32, ---------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
32-------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
---------	B	Rare--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Low.
32-------	B	None--------	---	---	>6.0	---	---	20-40	Hard	High-----	Moderate	Moderate.
---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
---------	C/D	Frequent----	Brief-----	Mar-Jun	+.5-1.0	Apparent	Oct-Jul	>60	---	High-----	High-----	Low.
32, ---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
32-------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Low.
---------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
, 397F--	A	None--------	---	---	>6.0	---	---	20-40	Rippable	Low------	Low------	Moderate.

otnote at end of table.

k of corrosion	
ated eel	Concrete
rate	Moderate.
h-----	Moderate.
rate	Moderate.
rate	Moderate.
rate	Moderate.
h-----	Low.
rate	Moderate.
erate	Moderate.
h-----	Moderate.
erate	High.
erate	Low.
h-----	Moderate.
------	Low.
------	Low.
erate	Low.
erate	Low.

	Risk of corrosion	
	Uncoated steel	Concrete
	Moderate	Moderate.
	Moderate	Moderate.
	Low------	Moderate.
	Moderate	Moderate.
	Low------	Moderate.
	Low------	Moderate.
	High-----	Low.
	Low------	Low.
	Low------	Low.
	Low------	Moderate.
	Low------	Low.
	Low------	Moderate.
	High-----	Low.
	Moderate	Moderate.

TABLE 17.--ENGINEERING TEST DATA

Soil name and location	Parent material	Report number	Depth	Moisture density		Percentage passing sieve--				Percentage smaller than--				Liquid limit	Plasticity index	Classification	
				Maximum dry	Optimum moisture	No. 4	No. 10	No. 40	No. 200	0.05 mm	0.02 mm	0.005 mm	0.002 mm			AASHTO	Unified
			In	Lb/cu ft	Pct									Pct			
Atkinson silt loam:																	
Ogle County; 1,330 feet west and 1,245 feet south of the NE corner, sec. 5, T. 40 N., R. 2 E.	Glacial outwash and residuum over limestone bedrock.	1-1	0-10	104	18	100	100	97	85	74	52	30	20	33	10	A-6(8)	CL
		1-4	20-30	106	18	98	98	94	78	75	53	34	28	46	22	A-7-6 (16)	CL
		1-7	39-43	95	25	99	99	95	74	65	56	50	42	52	27	A-7-6 (20)	CH
Eleva sandy loam:																	
Ogle County; 2,077 feet east and 9 feet south of the NW corner of sec. 5, T. 22 N., R. 10 E.	Residuum over sandstone bedrock.	1-1	0-3	119	11	99	98	92	39	37	18	18	5	18	*NP	A-4	SC
		1-4	13-21	120	12	97	96	90	32	31	26	19	17	24	10	A-4	SC
		1-6	28-35	110	11	94	93	91	6	5	5	4	3	---	NP	A-2-4	SP-SM
Varna silt loam:																	
Ogle County; 836 feet north and 362 feet west of the SE corner of sec. 4, T. 42 N., R. 2 E.	Glacial till.	1-1	0-9	104	19	100	100	99	91	85	60	36	31	34	14	A-6	CL
		1-5	24-32	107	18	100	99	96	81	78	69	48	39	46	27	A-7-6	CL
		1-6	32-40	124	12	96	95	88	77	67	59	29	23	28	13	A-6	CL

* NP means nonplastic.

TABLE 18.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Ashdale	Fine-silty, mixed, mesic Typic Argiudolls
*Assumption	Fine-silty, mixed, mesic Typic Argiudolls
Atkinson	Fine-loamy, mixed, mesic Typic Argiudolls
Atterberry	Fine-silty, mixed, mesic Udollic Ochraqualfs
Batavia	Fine-silty, mixed, mesic Mollic Hapludalfs
Birkbeck	Fine-silty, mixed, mesic Typic Hapludalfs
Boone	Mesic, uncoated Typic Quartzipsamments
Canisteo	Fine-loamy, mixed (calcareous), mesic Typic Haplaquolls
Catlin	Fine-silty, mixed, mesic Typic Argiudolls
*Chelsea	Mixed, mesic Alfic Udipsamments
*Comfrey	Fine-loamy, mixed, mesic Cumulic Haplaquolls
Dickinson	Coarse-loamy, mixed, mesic Typic Hapludolls
Dodge	Fine-silty, mixed, mesic Typic Hapludalfs
Downs	Fine-silty, mixed, mesic Mollic Hapludalfs
Drummer	Fine-silty, mixed, mesic Typic Haplaquolls
Du Page	Fine-loamy, mixed, mesic Cumulic Hapludolls
Dubuque	Fine-silty, mixed, mesic Typic Hapludalfs
Dunbarton	Clayey, montmorillonitic, mesic Lithic Hapludalfs
Durand	Fine-loamy, mixed, mesic Typic Argiudolls
Elburn	Fine-silty, mixed, mesic Aquic Argiudolls
Elco	Fine-silty, mixed, mesic Typic Hapludalfs
Eleva	Coarse-loamy, mixed, mesic Typic Hapludalfs
Fayette	Fine-silty, mixed, mesic Typic Hapludalfs
Flagg	Fine-silty, mixed, mesic Typic Hapludalfs
Flanagan	Fine, montmorillonitic, mesic Aquic Argiudolls
Fox	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs
Griswold	Fine-loamy, mixed, mesic Typic Argiudolls
Hitt Variant	Fine-loamy, mixed, mesic Typic Argiudolls
Houghton	Euic, mesic Typic Medisaprists
*Huntsville	Fine-silty, mixed, mesic Cumulic Hapludolls
Jasper	Fine-loamy, mixed, mesic Typic Argiudolls
Kendall	Fine-silty, mixed, mesic Aeric Ochraqualfs
Kidder	Fine-loamy, mixed, mesic Typic Hapludalfs
*La Hogue	Fine-loamy, mixed, mesic Aquic Argiudolls
Lamont	Coarse-loamy, mixed, mesic Typic Hapludalfs
La Rose	Fine-loamy, mixed, mesic Typic Argiudolls
*Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls
Martinsville	Fine-loamy, mixed, mesic Typic Hapludalfs
Miami	Fine-loamy, mixed, mesic Typic Hapludalfs
*Millbrook	Fine-silty, mixed, mesic Udollic Ochraqualfs
Millington	Fine-loamy, mixed (calcareous), mesic Cumulic Haplaquolls
*Muscatine	Fine-silty, mixed, mesic Aquic Hapludolls
Myrtle	Fine-silty, mixed, mesic Mollic Hapludalfs
Ockley	Fine-loamy, mixed, mesic Typic Hapludalfs
Odell	Fine-loamy, mixed, mesic Aquic Argiudolls
*Ogle	Fine-silty, mixed, mesic Typic Argiudolls
Orion	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Palsgrove	Fine-silty, mixed, mesic Typic Hapludalfs
Parr	Fine-loamy, mixed, mesic Typic Argiudolls
Pecatonica	Fine-loamy, mixed, mesic Typic Hapludalfs
Plano	Fine-silty, mixed, mesic Typic Argiudolls
Radford	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
*Ripon	Fine-silty, mixed, mesic Typic Argiudolls
Rockton	Fine-loamy, mixed, mesic Typic Argiudolls
*Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls
Ross	Fine-loamy, mixed, mesic Cumulic Hapludolls
Rozetta	Fine-silty, mixed, mesic Typic Hapludalfs
Sable	Fine-silty, mixed, mesic Typic Haplaquolls
Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls
Saybrook	Fine-silty, mixed, mesic Typic Argiudolls
Selma	Fine-loamy, mixed, mesic Typic Haplaquolls
Sidell	Fine-silty, mixed, mesic Typic Argiudolls
*Sogn	Loamy, mixed, mesic Lithic Haplustolls
Sparta	Sandy, mixed, mesic Entic Hapludolls
St.Charles	Fine-silty, mixed, mesic Typic Hapludalfs
Stronghurst	Fine-silty, mixed, mesic Aeric Ochraqualfs
Symerton	Fine-loamy, mixed, mesic Typic Argiudolls
Tama	Fine-silty, mixed, mesic Typic Argiudolls

TABLE 18.--CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
Varna	Fine, illitic, mesic Typic Argiudolls
Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
Waukee	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludolls
Wea	Fine-loamy, mixed, mesic Typic Argiudolls
Westville	Fine-loamy, mixed, mesic Typic Hapludalfs
Whalan	Fine-loamy, mixed, mesic Typic Hapludalfs
*Winnebago	Fine-loamy, mixed, mesic Typic Argiudolls
Woodbine	Fine-loamy, mixed, mesic Typic Hapludalfs

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