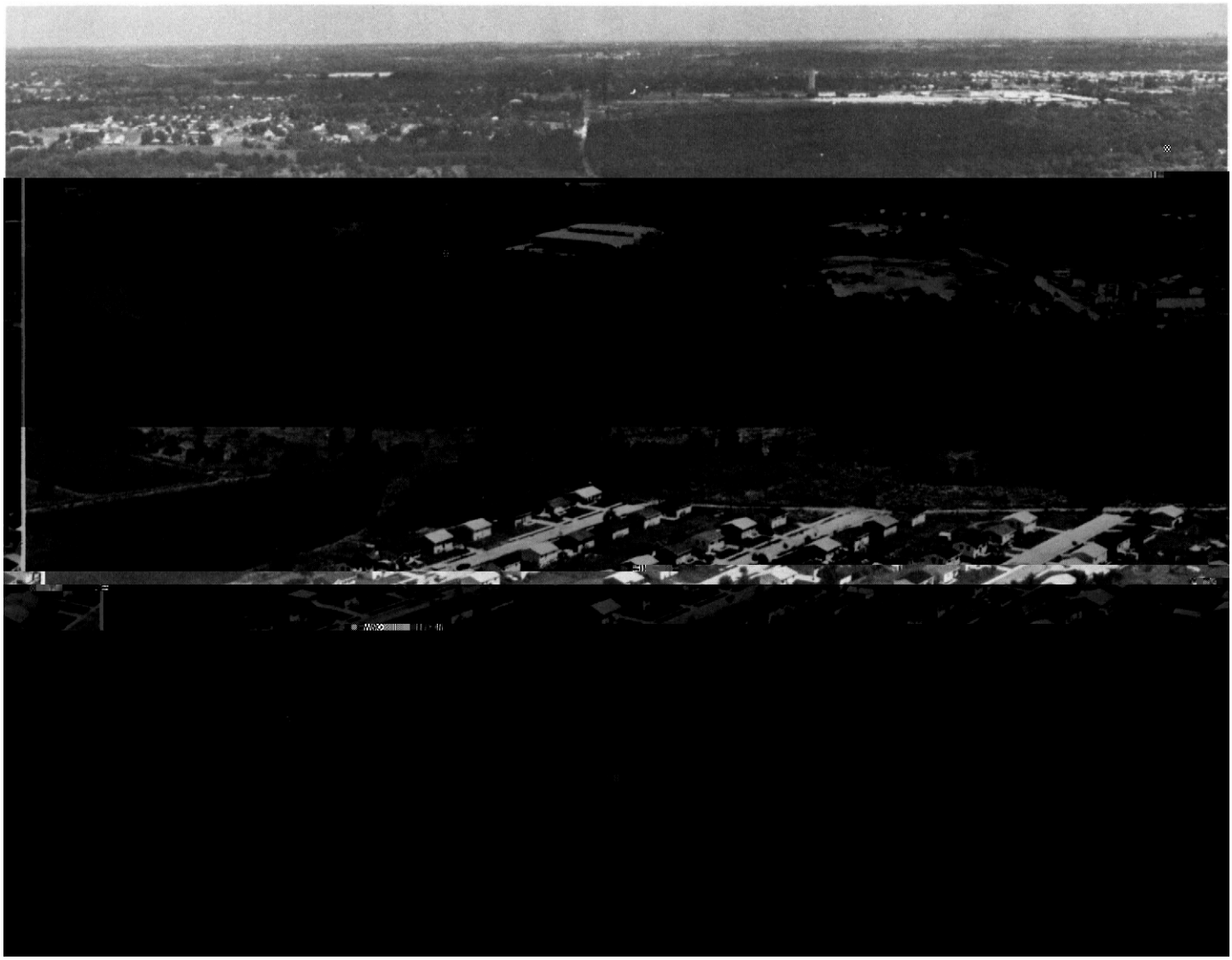
SOIL SURVEY OF

Kane County, Illinois



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

HOW TO USE

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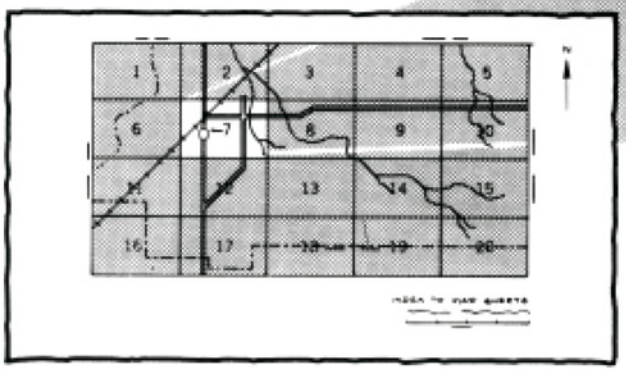

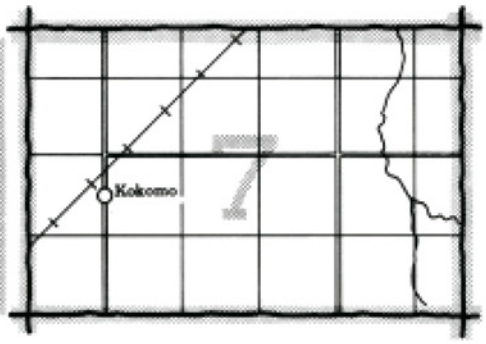

2. Note the number of the map sheet and turn to that sheet.

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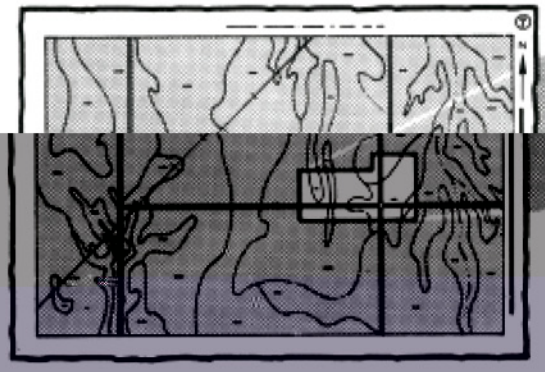
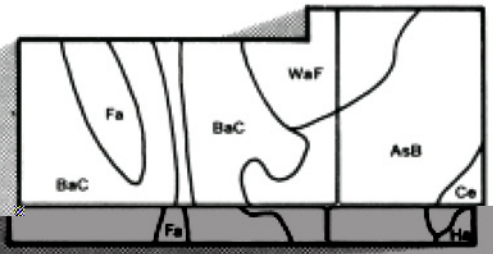


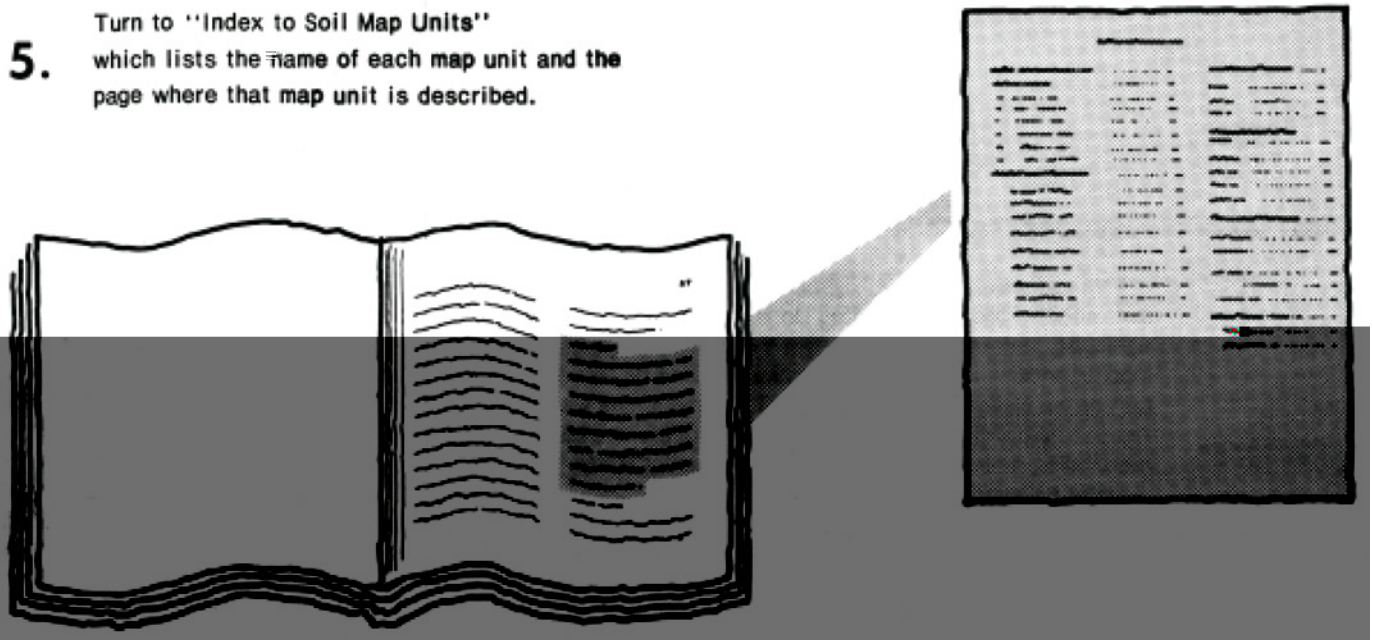


4. List the map unit symbols that are in your area.

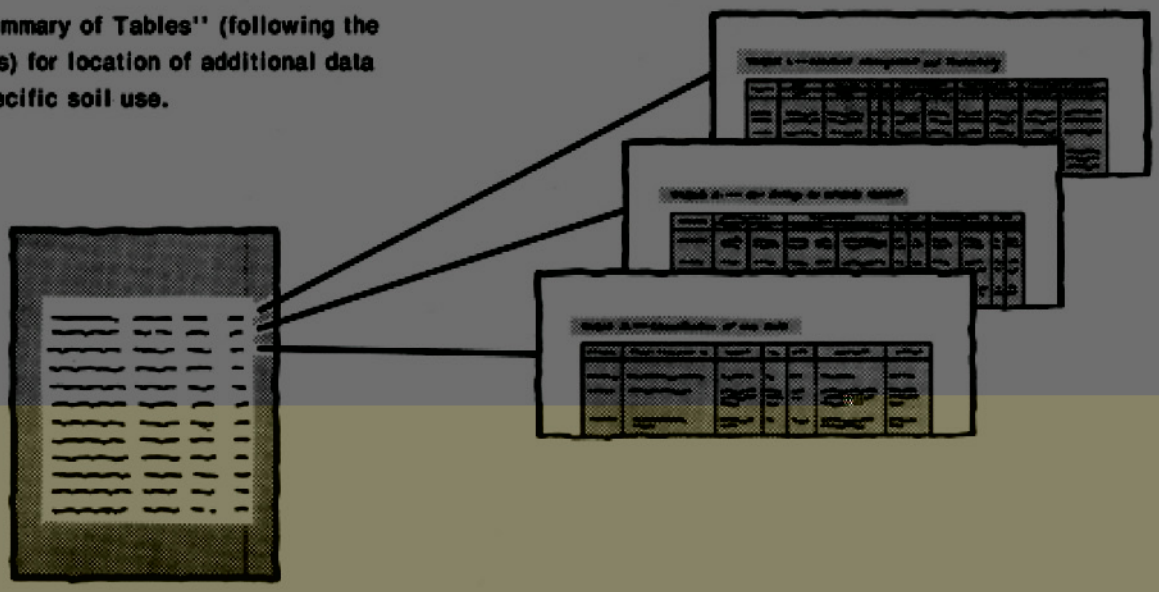
Symbols

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 1966-75. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Kane-Du Page Soil and Water Conservation District. The cost was shared by the Kane County Board of Supervisors.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

This survey is Illinois Agriculture Experiment Station Soil Report No. 109.

Cover: Urban land frequently encroaches on farmland in the county. The Proctor soils in the foreground are well suited to farming and only moderately well suited to dwellings.

Contents

	Page
Index to soil map units	v
Summary of tables	vii
Foreword	ix
General nature of the county	1
Natural resources	1
Relief and drainage	1
Settlement of the county	1
Farming	2
Climate	2
How this survey was made	2
General soil map for broad land use planning	3
Nearly level to moderately steep soils that are moderately permeable in the subsoil and moderately to very rapidly permeable in the underlying material; on outwash plains, kamic ridges, and eskers	3
1. Will-Warsaw-Canisteo	3
2. Fox-Casco-Dresden	4
3. Bowes-Dresden-Fox	4
4. Waupecan-Drummer	5
Nearly level to moderately steep soils that are moderately permeable; on end moraines, ground moraines, and outwash plains	5
5. Drummer-Elburn	5
6. Drummer-Saybrook-Catlin	6
7. Miami-Octagon	6
8. Octagon-Saybrook-Drummer	7
9. Dodge-Birkbeck-Camden	7
10. Miami-Dodge	7
11. Drummer-Harvard	8
Nearly level to moderately sloping soils that are moderately permeable; on uplands, terraces, and flood plains	8
12. Dresden-Millington	8
Nearly level to moderately steep soils that are moderately slowly and slowly permeable; on end moraines	9
13. Morley-Beecher	9
14. Milford-Varna-Markham	9
Soil maps for detailed planning	10
Soil descriptions	10
Use and management of the soils	69
Crops and pasture	69
Yields per acre	71
Capability classes and subclasses	71
Windbreaks and environmental plantings	72
Engineering	72
Building site development	73
Sanitary facilities	74
Construction materials	74
Soil properties	77
Engineering properties	77
Physical and chemical properties	78
Soil and water features	79
Classification of the soils	80
Soil series and morphology	81
Batavia series	81
Beecher series	81
Birkbeck series	82
Bowes series	82
Brenton series	83
Camden series	83
Canisteo series	84
Casco series	84
Catlin series	85
Dodge series	85
Dresden series	86
Drummer series	86
Elburn series	86
Elliott series	87
Faxon series	87
Flanagan series	88
Fox series	88
Harpster series	89
Harvard series	89
Herbert series	89
Houghton series	90
Kane series	90
Kidder series	91
La Rose series	91
Lena series	91
Lisbon series	92
Lorenzo series	92
Markham series	93
Martinsville series	93
Miami series	93
Milford series	94
Millbrook series	94
Millington series	95
Morley series	95
Mundelein series	96
Octagon series	96
Otter series	96
Peotone series	97
Plano series	97
Proctor series	98
Ripon series	98
Rodman series	99
Rush series	99
Sabina series	99

Contents—continued

	Page
Thorp series	101
Varna series	102
Virgil series	102
Warsaw series	103
Wauconda series	103
Waupecan series	103
Will series	104
Zurich series	104
Formation of the soils	105
Parent material	105
Plants and animals	106
Climate	106
Relief	106
Time	106
Geology of the county	107
References	108
Glossary	108
Illustrations	113
Tables	121

Issued April 1979

Index to soil map units

	Page
24B—Dodge silt loam, 2 to 5 percent slopes	10
24C2—Dodge silt loam, 5 to 10 percent slopes, eroded	11
27B—Miami silt loam, 2 to 5 percent slopes	12
27C2—Miami silt loam, 5 to 10 percent slopes, eroded	12
27D2—Miami silt loam, 10 to 15 percent slopes, eroded	13
27D3—Miami clay loam, 10 to 15 percent slopes, severely eroded	13
59—Lisbon silt loam	14
60C2—La Rose loam, 5 to 10 percent slopes, eroded	15
60D2—La Rose loam, 10 to 15 percent slopes, eroded	15
62—Herbert silt loam	16
67—Harpster silty clay loam	16
69—Milford silty clay loam	17
76—Otter silt loam	18
82—Millington loam	18
93F—Rodman soils, 15 to 30 percent slopes	19
103—Houghton muck	19
104—Virgil silt loam	20
105A—Batavia silt loam, 0 to 2 percent slopes	21
105B—Batavia silt loam, 2 to 5 percent slopes	21
[illegible]	[illegible]

	Page
223C2—Varna silt loam, 5 to 10 percent slopes, eroded	37
233A—Birkbeck silt loam, 0 to 2 percent slopes	37
233B—Birkbeck silt loam, 2 to 5 percent slopes	38
233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded	39
236—Sabina silt loam	39
243A—St. Charles silt loam, 0 to 2 percent slopes	40
243B—St. Charles silt loam, 2 to 5 percent slopes	40
290A—Warsaw loam, 0 to 2 percent slopes	41
290B—Warsaw loam, 2 to 5 percent slopes	41
298—Beecher silt loam	42
318A—Lorenzo loam, 0 to 2 percent slopes	43
318B—Lorenzo loam, 2 to 5 percent slopes	43
318C2—Lorenzo clay loam, 5 to 10 percent slopes, eroded	44
323D—Casco loam, 10 to 15 percent slopes	44
323E—Casco loam, 15 to 20 percent slopes	45
325A—Dresden silt loam, 0 to 2 percent slopes	45
325B—Dresden silt loam, 2 to 5 percent slopes	46
325C—Dresden silt loam, 5 to 10 percent slopes	46
327A—Fox silt loam, 0 to 2 percent slopes	47
327B—Fox silt loam, 2 to 5 percent slopes	47
327C—Fox silt loam, 5 to 10 percent slopes	48
327D—Fox silt loam, 10 to 15 percent slopes	49

Index to soil map units—continued

	Page
791C2—Rush silt loam, 5 to 10 percent slopes, eroded	63
792A—Bowes silt loam, 0 to 2 percent slopes	64
792B—Bowes silt loam, 2 to 5 percent slopes	65
792C—Bowes silt loam, 5 to 10 percent slopes	65
864—Pits, quarry, limestone	66
865—Pits, gravel	66
921B—Faxon-Ripon complex, 0 to 5 percent slopes	66
938C—Miami-Casco complex, 4 to 10 percent slopes	67
938E—Miami-Casco complex, 10 to 20 percent slopes	68
1103—Houghton muck, wet	68

Summary of Tables

	Page
Acreage and proportionate extent of the soils (Table 4) ..... *Acres. Percent.*	124
Building site development (Table 7) ..... *Shallow excavations. Dwellings without basements. Dwellings with basements. Small commercial buildings. Local roads and streets. Lawns and landscaping.*	136
Classification of the soils (Table 16) ..... *Family or higher taxonomic class.*	179
Construction materials (Table 9) ..... *Roadfill. Sand. Gravel. Topsoil.*	146
Engineering properties and classifications (Table 13) ..... *Depth. USDA texture. Classification—Unified, AASHTO. Fragments greater than 3 inches. Per-*	164

Page

than; Average number of growing degree days. Precipitation—Average; 2 years in 10 will have—Less than, More than; Average number of days with 0.10 inch or more; Average snowfall.

Water management (Table 10) 150

Pond reservoir areas. Embankments, dikes, and levees. Drainage. Irrigation. Terraces and diversions. Grassed waterways.

Wildlife habitat potentials (Table 12) 160

Potential for habitat elements—Grain and seed crops, Grasses and legumes, Wild herbaceous plants, Hardwood trees, Coniferous plants, Wetland plants, Shallow water areas. Potential as habitat for—Openland wildlife, Woodland wildlife, Wetland wildlife.

Windbreaks and environmental plantings (Table 6) 131

Trees having predicted 20-year average height, in feet, of—Less than 8, 8 to 15, 16 to 25, 26 to 35, More than 35.

Yields per acre of crops and pasture (Table 5) 126

Corn, Soybeans, Winter wheat, Oats, Grass-legume hay, Bromegrass-alfalfa.

Foreword

This soil survey contains much information useful in land-planning programs in Kane County. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

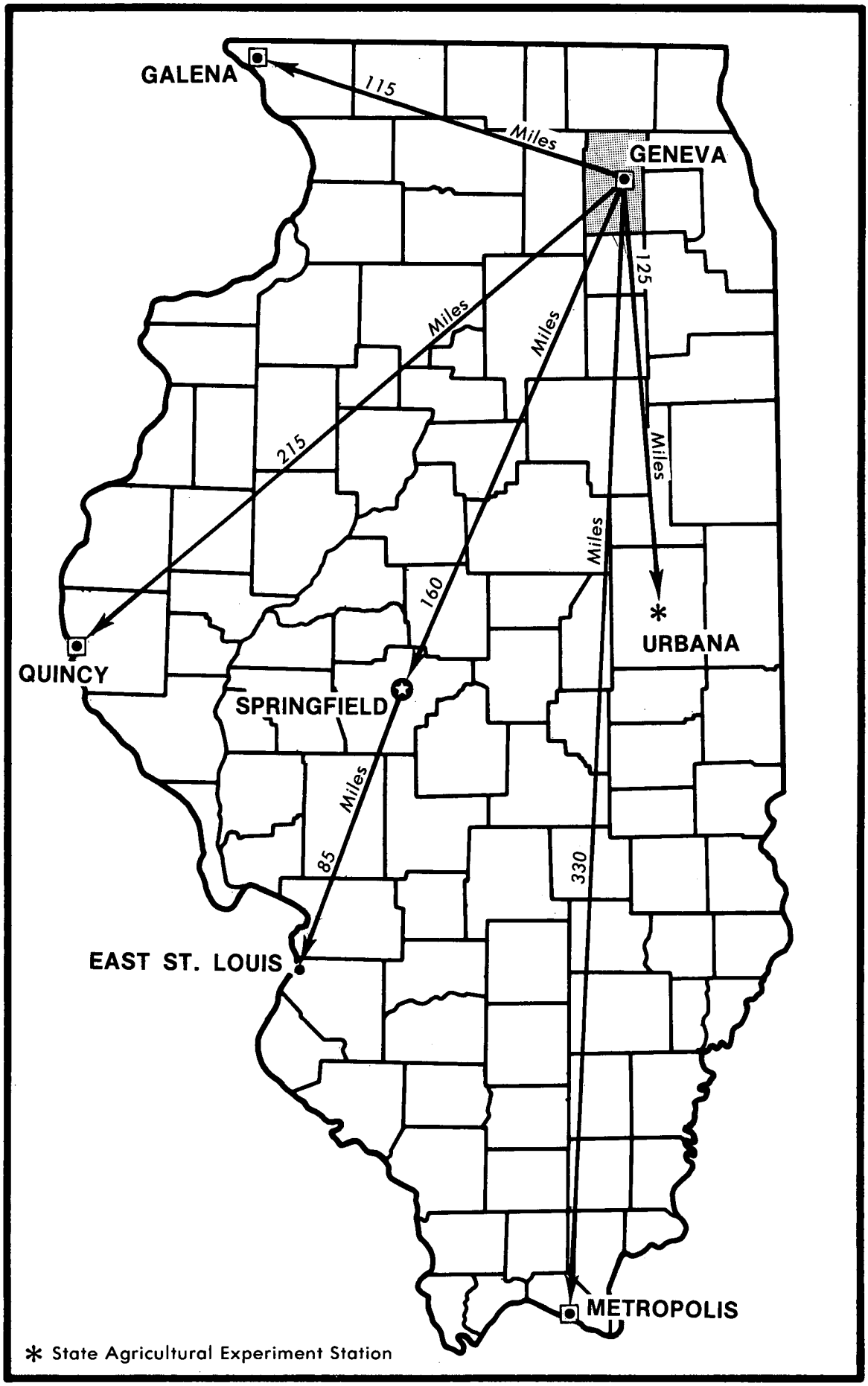
Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption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

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

Daniel E. Holmes

Daniel E. Holmes
State Conservationist
Soil Conservation Service



Location of Kane County in Illinois.

SOIL SURVEY OF KANE COUNTY, ILLINOIS

By Tyrone M. Goddard, Soil Conservation Service

Fieldwork by Tyrone M. Goddard, K. C. Hinkley, James R. Martin, Christopher Cochran, Robert T. Hendrickson, Soil Conservation Service

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

KANE COUNTY is in the extreme northeastern part of Illinois as shown on the map on the facing page. It has a total area of 332,800 acres, or 520 square miles. In 1970 the population was 251,000. Aurora, the most populous city, is in the southeastern part of the county. It has a population of 79,600.

The urban centers of the county are mainly along the Fox River in the eastern part of the county. Most of the county is influenced by urban development, however, and competition between urban and agricultural land uses is an important issue. Nearly one-third of the county was in urban development in 1970.

About 254,000 acres was used for agriculture in 1974. The principal crops grown are corn, soybeans, oats, and wheat. Grasses and legumes are also grown, and many farms have livestock. Commercial woodland production in the county is minimal.

General nature of the county

This section contains information of a general nature concerning the county. It includes sections on natural resources, relief, settlement, farming, and climate.

Natural resources

Sand and gravel deposits in various places throughout the county and limestone quarries along the Fox River and in Big Rock Township provide building materials needed for construction. Peat and muck in Nelson Lake and in areas to the north in Rutland Township are also excavated for commercial use. Oak and hickory groves, once abundant in the Fox River Valley, are now mostly in county forest preserves, which provide areas for recreation.

Water for the county is supplied by surficial drainage into the Kishwaukee and Fox river watersheds, as well as water supplies in shallow and deep aquifers (*7, 10*). Shallow aquifers include both Wisconsin age glacial deposited sand and gravel aquifers and the Silurian dolomite aquifers. These aquifers are recharged from local precipitation and surface stream inflow. Deep aquifers, running northwest-southeast on a slope of 0.2 percent, are in Cambrian-Ordovician sandstone and Mt. Simon sandstone. Recharge areas for these aquifers are in De Kalb, McHenry, Boone, and northwest Kane Counties.

Relief and drainage

Elevation in Kane County ranges from about 630 feet above sea level in the city of Montgomery near the southeastern corner of the county to 1,065 feet above sea level in Plato Township on Tower Road. Johnson's Mound in the central part of the county has an elevation of 898 feet.

More than 90 percent of the soils in the county are on uplands that consist of glacial till and outwash areas. They are discussed in more detail in the section "Geology of the County."

The major bottom-land areas are along Big Rock, Blackberry, Ferson, Mill, Tyler, and Welch Creeks and the Fox River.

About 60 percent of the county is in the Fox River watershed. The major streams flow south and east into the Fox River. The northwestern part of the county drains north and west into the Kishwaukee River.

The principal sources of water are wells drilled 700 to 2,300 feet deep into the Cambrian-Ordovician sandstone aquifer system and 100 to 150 feet deep into the Silurian dolomite aquifer system. Water from these sources supplies dwellings and industry in cities along the Fox River. Shallow wells, less than 150 feet deep in sand and gravel aquifers, generally supply water for small towns and farmsteads in the western part of the county. In many areas, water is stored in ponds and used for livestock.

Settlement of the county

The original inhabitants of Kane County were Pottawatomie Indians. They had settlements near the Fox River in Aurora and Dundee and south of Batavia. Two Indian chiefs whose names have become well known were

Waubonsee and Shabbona. These chiefs and their people were friendly to the early settlers.

When the first settlers came to the county in 1833, they found abundant hardwood forest adjacent to the Fox River, which dissects the eastern part of the county, and lush prairie grasses in the western part of the county (*6*). The early settlers made their homes near the Fox River. Christopher Payne, the first settler, lived east of the present city of Batavia. A trading store was located along Mill Creek, near Mooseheart, and trading was carried on with the Indians as well as with other settlers. St. Charles became the first incorporated town in 1839. The first school was located in Montgomery.

Settlement increased in the county when the Blackhawk War with the Indians in northern Illinois came to an end. This war has been named for Blackhawk, chief of the Fox and Sac nations. Chiefs Shabbona and Waubonsee sided with the settlers during the war.

In 1840, the population of the county was 6,500. It increased to 16,700 people by 1850 and to 30,000 by 1860. Most of these people were farmers, but the urban centers along the Fox River were established.

The population in 1900 was 70,000; by 1950 it had nearly doubled to 150,000; and by 1970 it was 251,000. Most of the towns in the county have industries, but many residents commute to Chicago and nearby towns for work (*8*).

Farming

Most of the Indians who inhabited Kane County when the settlers came obtained their food by hunting and fishing; however, farming was an important source of food for a small Indian settlement in northeastern Kane County.

Many of the early settlers who migrated from New York and Pennsylvania in the 1830's found the timber land more attractive for cultivation than the prairies. They began clearing trees and planting crops. The prairie land was not easily cultivated with horse and plow. The prairie grasses had a dense rooting system and they often grew to 10 or 15 feet in height and covered large areas.

By 1870, however, most of the land in the county was farmed. There were about 240,000 acres of improved land, 35,000 acres of woodland, and the rest was unimproved acreage. The main crops were oats, Indian corn, and spring wheat.

Drainage districts were organized in the county during the period 1900 to 1920. This made possible the cultivation of more land and improved the yield of some of the land already under cultivation.

Erosion control became an important issue among farmers in the county in the late 1930's. An outgrowth of this concern was the formation of the Kane County Soil and Water Conservation District in 1944. The district was later expanded to include Du Page County.

Acreage in farmland began to decline during the 1950's. farms in Kane County with a total of 253,926 acres. About 106,218 acres were used for corn, 69,358 acres for soybeans, 10,971 acres for oats, and 3,093 acres for wheat. About 9,312 acres were in pasture, and 15,614 acres were in hayland. There were 589 farms with dairy or beef herds.

Climate

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Aurora for the period 1951 to 1973. 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 24 degrees F, and the average daily minimum temperature is 16 degrees. The lowest temperature on record, which occurred at Aurora on February 2, 1951, is minus 25 degrees. In summer the average temperature is 71 degrees, and the average daily maximum temperature is 83 degrees. The highest recorded temperature, which occurred on July 10, 1966, is 100 degrees.

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

Of the total annual precipitation, 34.7 inches, or 63 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 18 inches. The heaviest 1-day rainfall during the period of record was 10.48 inches at Aurora on October 10, 1954. Thunderstorms occur on about 38 days each year.

Average seasonal snowfall is 32 inches. The greatest snow depth at any one time during the period of record was 31 inches. On the average, 24 days have at least 1 inch of snow on the ground, but 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 75 percent. The percentage of possible sunshine is 70 in summer and 45 in winter. The prevailing wind is from the west. Average windspeed is highest, 12 miles per hour, in March.

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area know-

something about and perhaps identify some they had natural landscape. Typically, a map unit consists of one or

The Will soils are poorly drained. They have a black silty clay loam surface layer. The subsoil is very dark gray and olive gray clay loam in the upper part and dark gray and grayish brown sandy loam in the lower part. Warsaw soils are well drained. They have a very dark gray and very dark grayish brown loam surface layer and a subsoil that is dark yellowish brown and brown to dark brown clay loam in the upper part and brown to dark brown sandy clay loam in the lower part. Canisteo soils are poorly drained. They have a black loam surface layer and a very dark gray and gray clay loam subsoil.

The minor soils in this map unit are the Kane, Lena, Houghton, and Lorenzo soils. The somewhat poorly drained Kane soils are on low lying ridges; the very poorly drained Houghton and Lena soils are in closed yellowish brown and brown to dark brown clay loam and sandy clay loam in the lower part.

The minor soils in this map unit are the Will, Kane, Rodman, and Houghton soils. The poorly drained Will soils are in drainageways; the somewhat poorly drained Kane soils are on low lying ridges; and the excessively drained Rodman soils are on moderately steep and steep side slopes. The very poorly drained Houghton soils are in closed depressions.

The soils in this map unit are used mainly for cultivated crops, pasture, and woodland. They have good to fair potential for cultivated crops, pasture, woodland, and urban development.

Some management practices that maintain fertility and tilth and control erosion are needed for cropland.

The minor soils in this map unit are the Waupecan, Millington, Harvard, and Harpster soils. The well drained Waupecan soils are on ridgetops and knolls. The poorly drained Millington soils are on bottom lands along the Fox River, and the well drained and moderately well drained Harvard soils are on ridgetops. The poorly drained Harpster soils are in depressions.

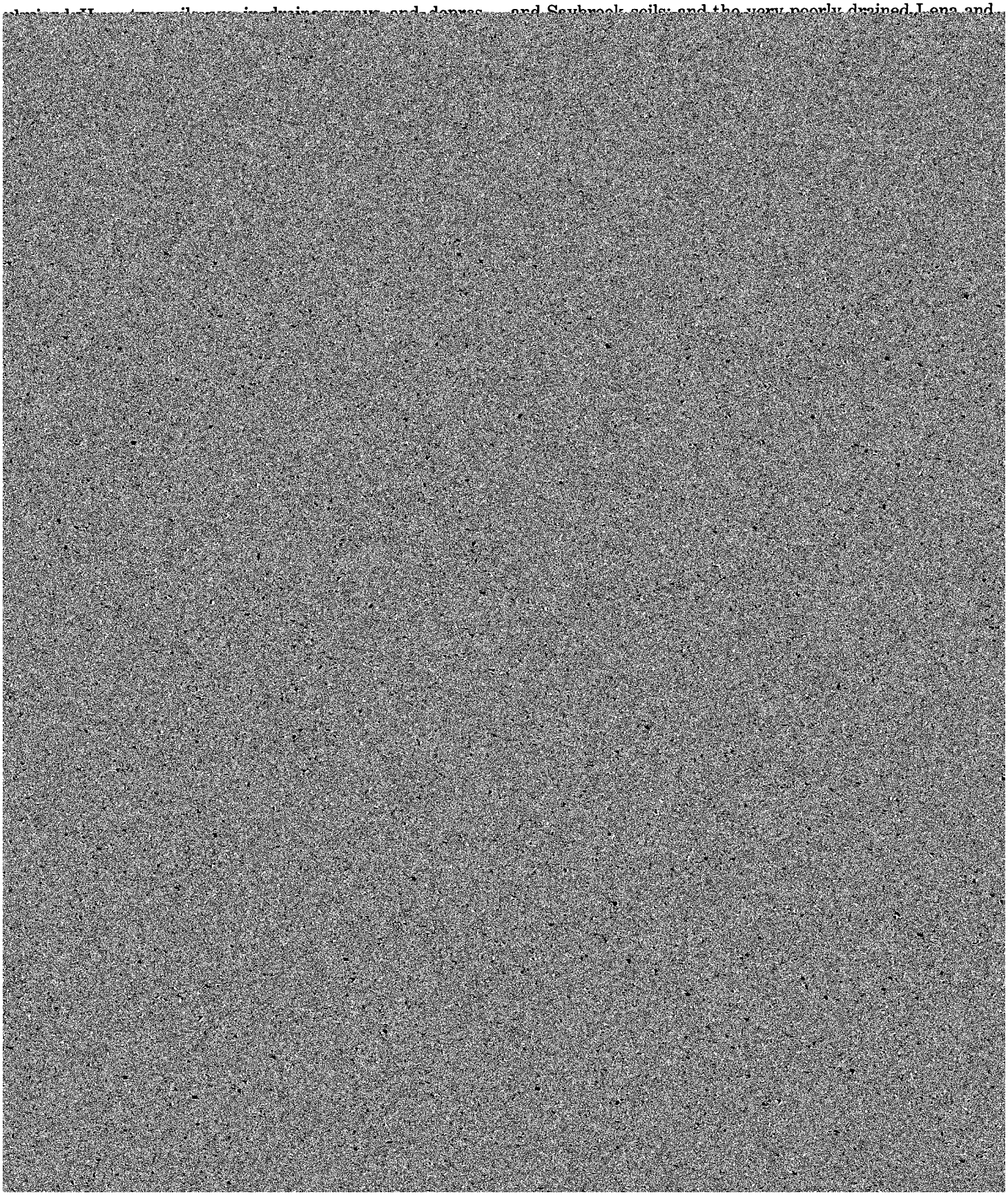
This map unit is used mainly for urban development. It has good potential for most urban uses and for cropland, pasture, and woodland.

The soils in this map unit have few limitations for urban development. The underlying sand and gravel allows rapid water movement downward, which may affect the suitability of these soils for sanitary facilities. Erosion

Providing adequate drainage in areas of poorly drained soils and erosion control in areas of sloping soils are the main management concerns for crops. Drained areas are well suited to crops and pasture. Varieties of grasses that can withstand wetness should be selected for pasture. The water table must be lowered before areas of poorly drained soils are suited to urban development. Well drained soils have few limitations for urban development.

Nearly level to moderately steep soils that are moderately permeable; on end moraines, ground moraines, and outwash plains

This group consists of seven map units that make up



tions for pasture and woodland. Pasture and woodland must be carefully managed, however, in areas of moderately steep soils to minimize erosion.

8. Octagon-Saybrook-Drummer

Deep, nearly level to strongly sloping, well drained and the underlying loamy till or stratified loamy outwash material and have silty and loamy subsoils

Geologically, this map unit is on a ground moraine of Malden Till. It is dissected by Big Rock and Welch Creeks. Short, strong slopes are adjacent to the major

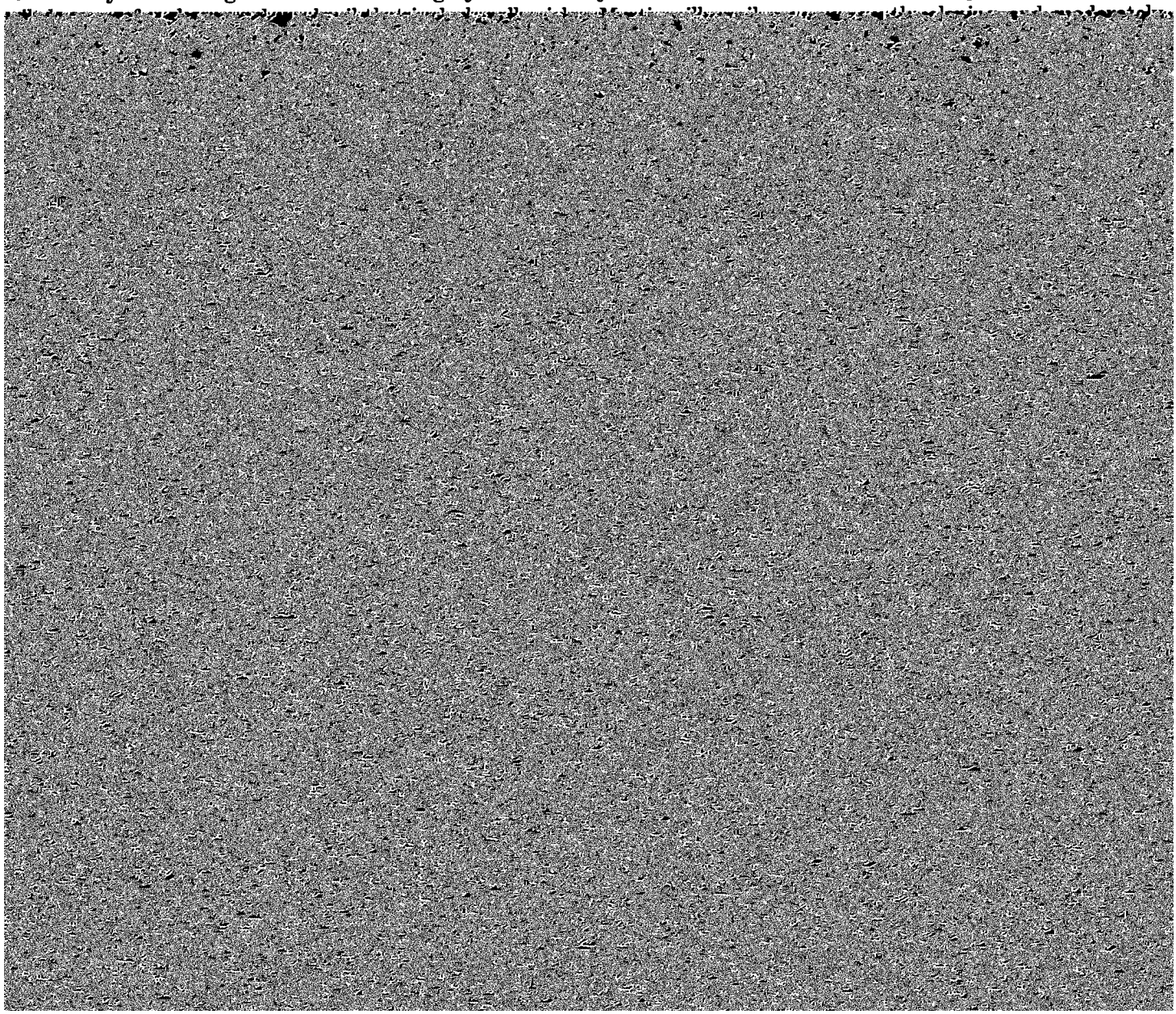
Geologically, this map unit is on end moraines in Malden Till and Tiskilwa Till. The landscape has an irregular topography of many short slopes, which are dissected by drainageways.

This map unit occupies about 11 percent of the county. Miami soils make up about 30 percent of the unit, Dodge soils make up about 30 percent, and the remaining 40 percent is minor soils.

Miami soils are on gently to strongly sloping ridges and side slopes. They are near Dodge soils in areas where glacial till occurs close to the surface. Dodge soils are on gently sloping and moderately sloping ridges.

Miami soils have a very dark grayish brown silt loam surface layer. The subsurface layer is brown silt loam, and the subsoil is brown to dark brown and reddish brown clay loam. Dodge soils have a dark grayish brown mottled, very dark gray, dark gray, and grayish brown silty clay loam in the upper part and mottled, gray sandy loam in the lower part. Harvard soils are well drained and moderately well drained. They have a very dark grayish brown silt loam surface layer and a brown to dark brown and yellowish brown subsoil that is silty clay loam in the upper part and clay loam in the lower part.

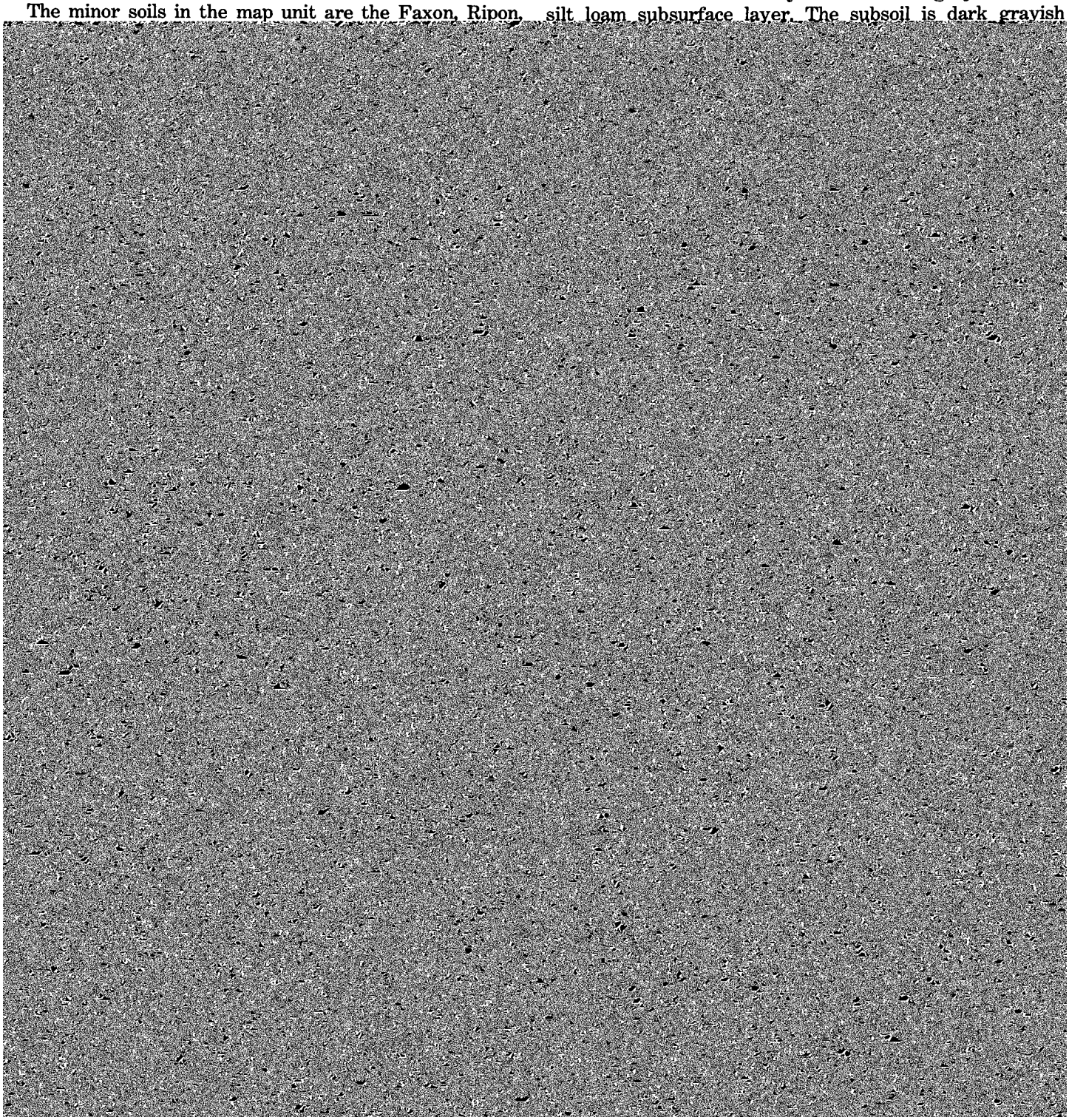
Minor soils in the map unit are the Brenton, Millbrook, Camden, St. Charles, Batavia, Martinsville, Selma, and Virgil soils. Brenton, Millbrook, and Virgil soils are somewhat poorly drained and are on nearly level, low lying ridges and knolls. They are between Drummer and Harvard soils on the landscape. The well drained and moderately well drained Batavia, Camden, and St. Charles soils are on ridgetops and knolls. They are adjacent to Harvard soils on the landscape. The well drained



brown to dark brown silty clay loam in the upper part and dark yellowish brown and brown to dark brown clay loam and sandy loam in the lower part. They are underlain by sand and gravel. Millington soils are poorly drained. They have a black loam and silty clay loam surface layer and a subsoil that is stratified, black and very dark gray sandy loam and silty clay loam.

The minor soils in the map unit are the Faxon, Ripon,

Morley soils are well drained and moderately well drained. They have a very dark grayish brown silt loam surface layer and a brown silt loam subsurface layer. The subsoil is brown to dark brown silty clay loam and silty clay. It is mottled in the lower part. Beecher soils are somewhat poorly drained. They have a very dark grayish brown silt loam surface layer and a dark grayish brown silt loam subsurface layer. The subsoil is dark grayish



brown to dark brown and dark yellowish brown silty clay loam in the upper part and yellowish brown silty clay loam in the lower part. Markham soils are well drained and moderately well drained. They have a very dark grayish brown silt loam surface layer. The subsoil is brown to dark brown and dark yellowish brown silty clay loam in the upper part and yellowish brown and light yellowish brown silty clay loam in the lower part.

The minor soils in this map unit are the Elliott, Morley, and Peotone soils. The somewhat poorly drained Elliott soils are on nearly level, slight rises above Milford soils; the well drained and moderately well drained Morley soils are on gently sloping to strongly sloping ridges and side slopes adjacent to Varna and Markham soils.

The soils in this map unit are used for cropland, pasture, and urban development. They have good potential for cultivated crops, fair to poor potential for urban development, and good potential for pasture.

Providing adequate drainage in areas of poorly drained

thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped. The Batavia series, for example, was named for the town of Batavia in Kane County.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Saybrook silt loam, 0 to 2 percent slopes, is one of several phases within the Saybrook series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area in-

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsoil is about 28 inches thick. The upper part of the subsoil is dark yellowish brown silty clay loam, the middle part is yellowish brown clay loam, and the lower part is yellowish brown loam. The underlying material, to a depth of about 60 inches, is yellowish brown calcareous loam till. In places the subsoil is thicker and depth to calcareous loam is greater than it is in the typical profile. Some areas have a thicker and darker surface layer. Some areas of this map unit in the northeastern part of the county have calcareous sandy loam in the underlying material.

Included with this soil in mapping are small areas of somewhat poorly drained Herbert soils and poorly drained Drummer soils. These soils are in shallow depressions and drainageways. They make up 5 to 15 percent of the unit.

Water and air move through this soil [illegible]

This soil is well suited to most recreation uses. Good drainage and the silt loam texture provide a firm surface layer that can withstand heavy foot traffic. Few limitations restrict the use of this soil for camp areas, picnic sites, trails, footpaths, and bridle paths. Some leveling may be required before the soil can be made suitable for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to reduce the amount of dust in dry weather. Capability subclass IIe.

24C2—Dodge silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on convex ridgetops and short, uneven side slopes. Areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil is about 28 inches thick. The upper part of the subsoil is dark yellowish brown and yellowish brown silty clay loam, and the lower part is light

This soil is only moderately suited to dwellings without basements because it lacks sufficient stability in the subsoil, but this deficiency can be corrected by strengthening or replacing the base material. This soil is well suited to dwellings with basements. Frost heave is a concern when constructing local streets and roads but can be minimized by replacing subgrade material. Some grading may also be necessary.

This soil is well suited to septic tank absorption systems. In places the moderate rate of water movement in the underlying material is a concern, but problems can be avoided by increasing the size of the absorption field.

This soil is suited to most recreation uses. Good drainage and the silt loam texture provide a firm surface layer that withstands heavy foot traffic. There are few limitations for the construction and use of camp areas, picnic areas, trails, footpaths, and bridle paths. Leveling is needed before this soil is used for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to

tivated crops. Conservation tillage and winter cover crops help to control erosion. In a few areas slopes are long enough and smooth enough for terracing and contouring. Returning crop residue and adding animal manure help to maintain organic-matter content, improve fertility and soil tilth, increase water infiltration, and reduce soil loss.

This soil is suitable for urban development if proper design and installation procedures are used. The water table is generally below a depth of 5 feet. The soil lacks sufficient stability because it has moderate frost heave potential and the subsoil has moderate shrink-swell potential. Water moves downward through the soil at a moderate rate.

This soil is well suited to dwellings with and without basements. Frost heave is a concern when constructing local streets and roads but can be minimized by replacing subgrade material.

This soil is only moderately well suited to septic tank absorption fields because of the moderate percolation rate

a tendency to crust or become puddled after hard rains, especially in areas where the plow layer contains subsoil material.

Most areas of this soil are farmed. The potential is good to fair for crops and most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if this soil is used for cultivated crops. Conservation tillage, terracing, contouring, and grassed waterways help to reduce the amount of soil loss. Returning crop residue and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is suited to urban development if proper design and installation procedures are used. It lacks sufficient stability because it has moderate frost heave potential and the subsoil has moderate shrink-swell potential. The water table is usually below a depth of 5 feet. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of the lack of sufficient stability in the subsoil, but problems can be avoided by strengthening or replacing the base material. This soil is well suited to dwellings with basements. Frost heave is a concern when constructing local streets and roads but can be minimized by replacing subgrade material. Some grading is necessary in places. The soil is suited to septic tank absorption fields. In places the rate of water movement in the subsoil is a concern, but problems can be avoided by increasing the size of the absorption field.

This soil is suited to most recreation uses. Good drainage and silt loam texture provide a firm surface layer that can withstand heavy foot traffic. There are few [illegible]

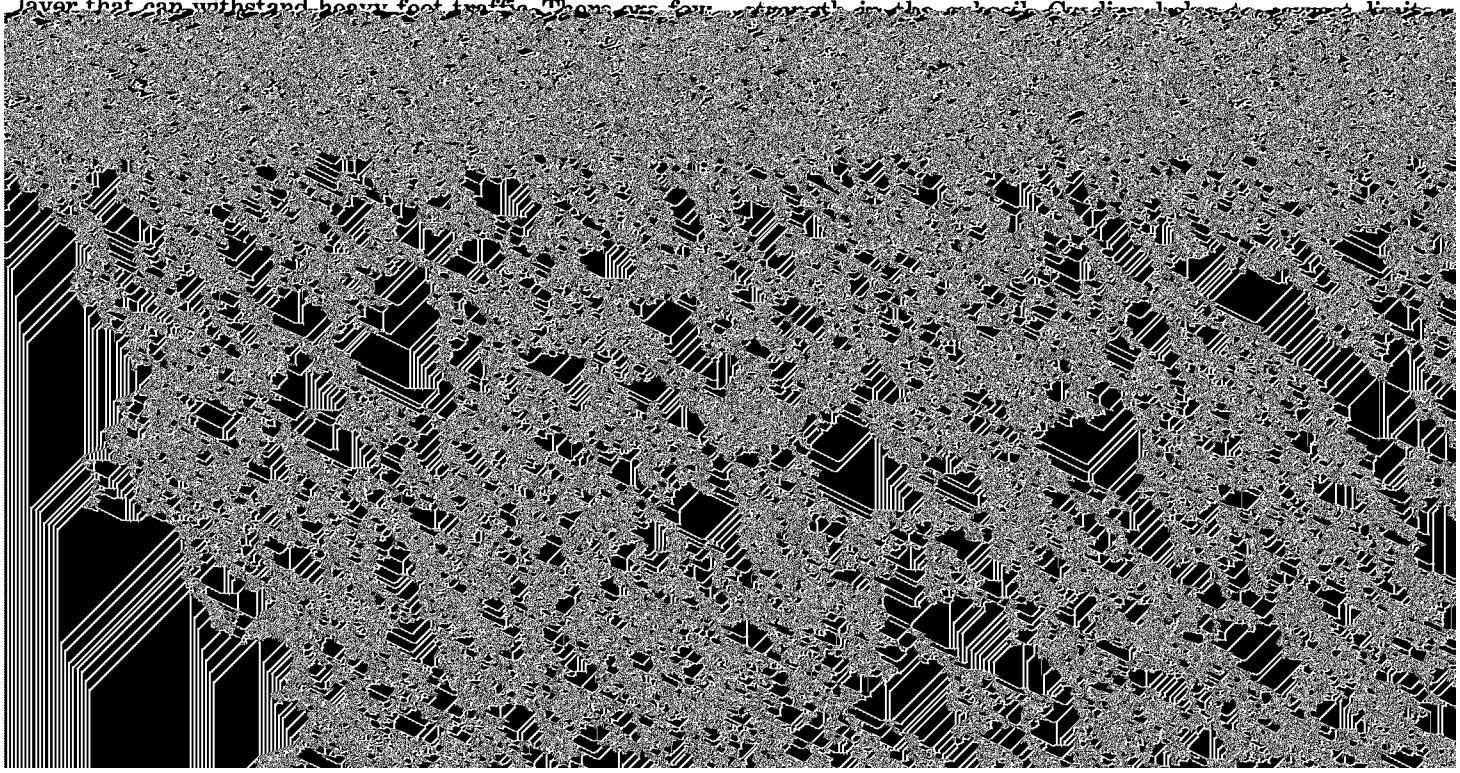
Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is rapid. Available water capacity is high. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is neutral or slightly acid. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range in moisture content; however, it may crust or puddle after hard rains, especially where the plow layer contains subsoil material.

Most areas of this soil are farmed. The potential is fair for crops and most urban uses.

This soil is better suited to grasses and legumes grown for hay and pasture than to other uses. Corn and soybeans can be grown as part of a cropping system if erosion is controlled; however, a cropping system in which more small grains are grown than corn and soybeans would be more suitable. The hazard of erosion is severe. Careful management is needed to control erosion and maintain fertility and good tilth. Terracing, contouring, grassed waterways, and conservation tillage help reduce the amount of soil erosion.

This soil is suited to some urban uses if proper design and engineering procedures are used. The water table is usually below a depth of 5 feet. Water moves downward through the soil at a moderate rate. There is insufficient stability in the surface layer due to the moderate shrink-swell potential and in the subsoil due to the moderate frost heave potential. Slope ranges from 10 to 15 percent.

This soil is only moderately suited to dwellings both with and without basements because of the somewhat excessive slope and the lack of sufficient stability and



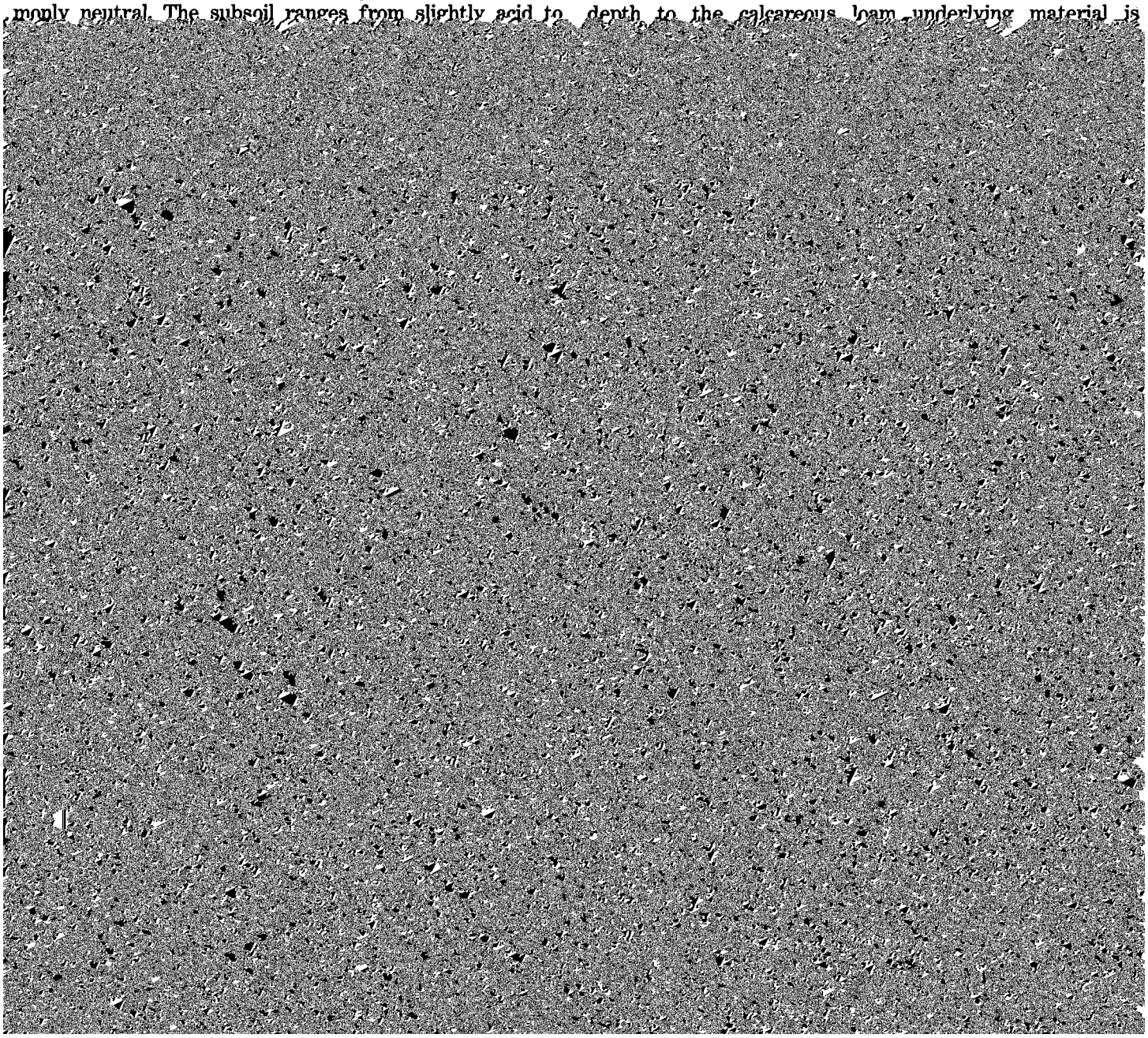
Typically, the surface layer is brown to dark brown clay loam about 5 inches thick. The subsoil is reddish brown clay loam about 16 inches thick. The underlying material, to a depth of 60 inches, is light reddish brown, calcareous loam. In some areas depth to calcareous loam is greater.

Included with this soil in mapping are small areas of somewhat poorly drained Herbert soils in shallow depressions and drainageways. They make up 0 to 5 percent of the map unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is rapid. Available water capacity is moderate. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil ranges from slightly acid to

59—Lisbon silt loam. This level or nearly level, somewhat poorly drained soil is in drainageways and on flats on uplands. Areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface layer is black and very dark gray silt loam about 13 inches thick. The subsoil is about 26 inches thick. The upper part is mottled, brown to dark brown and yellowish brown silty clay loam, and the lower part is mottled, brown and yellowish brown clay loam and loam. The underlying material, to a depth of 60 inches, is calcareous, mottled, light yellowish brown loam till. In places the surface layer is thinner and lighter, and in places, stratified outwash material is in the underlying material. In some areas where the subsoil is thicker, depth to the calcareous loam underlying material is



sion. Terracing is limited in some areas by short, uneven slopes and irregular topography.

This soil can support openland and woodland wildlife if field borders of grasses and legumes or hedgerows of hardwood and coniferous woody plants are established.

This soil is suitable for some urban uses if proper design and engineering procedures are used. The water table is usually below a depth of 5 feet. Water moves downward through the soil at a moderate rate. The soil lacks sufficient stability because it has moderate frost heave potential and the subsoil has moderate shrink-swell potential. Slopes range from 10 to 15 percent.

This soil is only moderately suited to dwellings both with and without basements because of the somewhat excessive slope and the lack of sufficient strength and stability in the subsoil. Grading can help correct slope limitations, and stability can be improved by strengthening or replacing the base material. Frost heave and slope are problems for construction of local streets and roads. Slope restrictions can be reduced by grading, and the hazard of frost heave can be reduced by replacing the subgrade material.

This soil is only moderately suited to septic tank absorption fields because of the somewhat excessive slope and the moderately slow percolation rate in the subsoil and underlying material. Increasing the size of the absorption field and grading will help to avoid problems. Slope and sidehill seepage are concerns when constructing sewage lagoons. Grading and sealing the bottoms of lagoons will help to avoid problems.

This soil is suited to some recreation uses, such as footpaths, trails, and bridle paths. Camp areas and picnic

drainageways. These included soils make up 5 to 15 percent of this map unit.

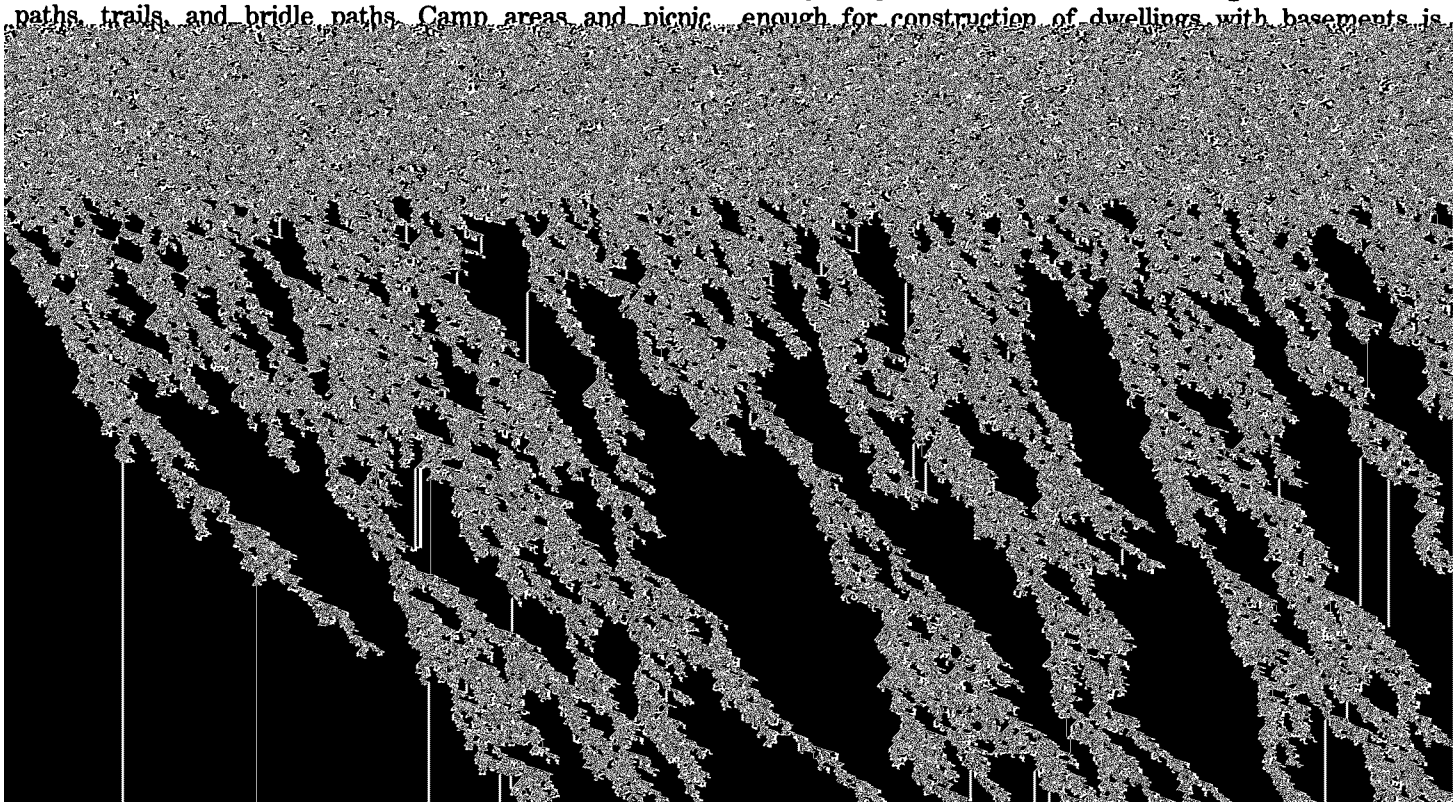
Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow. Reaction in the surface layer varies according to local liming practices, but it is commonly neutral. The subsoil is medium acid to mildly alkaline. Natural fertility and available water capacity are high, and organic-matter content is moderate. The surface layer is friable and can be easily tilled over a relatively wide range in moisture content.

Most areas of this soil are farmed, but some areas in the eastern part of the county are used for urban development. The potential is good for crops and fair to poor for most urban uses.

This soil is suited to corn, soybeans, wheat, oats, and to grasses and legumes grown for hay and pasture. In places wetness is a concern when the soil is used for cultivated crops. Where wetness is a problem, tile drains can be installed to improve drainage. Returning crop residue and adding animal manure help to maintain good tilth and organic-matter content and improve fertility.

This soil is suited to many urban uses if proper design and installation procedures are used. Depth to the seasonal water table is 1 foot to 3 feet. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of wetness and the lack of sufficient stability in the subsoil. The water table can be lowered by installing tile. Stability can be improved by strengthening or replacing the base material. Lowering the water table enough for construction of dwellings with basements is



stratified, grayish brown and light olive brown silt loam and sandy loam outwash. In places the surface layer and subsoil do not contain free carbonates. In some areas, stratified outwash is closer to the surface than typical.

Included with this soil in mapping are small areas of somewhat poorly drained Mundelein soils and well drained and moderately well drained Proctor soils on slight rises. These included soils make up 0 to 15 percent of the map unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow to ponded. Reaction in the surface layer varies with local liming practices but is commonly moderately alkaline. The subsoil is moderately alkaline. Natural fertility is high, and organic-matter content is very high. The surface layer is friable but becomes compact and cloddy if tilled when wet.

Most areas of this soil are farmed, but some areas in the county are used for urban development. The potential is good for crops and poor for most urban uses.

This soil is suited to corn, soybeans, wheat, oats, and to grasses and legumes grown for hay and pasture. Wetness is the main problem when this soil is used for cultivated crops. Tile drains and surface ditches improve drainage. If the soil is plowed in the fall and left bare, wind erosion may occur during spring. Winter cover crops or conservation tillage help reduce erosion. Returning crop residue and adding animal manure help to maintain good tilth and organic-matter content and improve fertility.

This soil is poorly suited to most urban uses. Depth to the seasonal water table is less than 1 foot. This soil is also subject to occasional flooding. It lacks sufficient stability because it has high frost heave potential, and the subsoil has moderate shrink-swell potential. Water moves downward through the soil at a moderate rate.

Areas of this soil that are used for urban development need to be artificially drained and protected from flooding. Dwellings with basements may be difficult or expensive to construct because of the difficulty in lowering the water table. Dwellings without basements should be constructed only after drainage systems are installed. Use of this soil for local streets and roads is limited by wetness, flooding, and frost heave potential. Installing drainage systems and use of fill material make this soil more suitable for streets and roads.

Conventional septic tank absorption fields should not be constructed because of wetness and flooding. All sanitary facilities should be connected to commercial sewers and treatment plants. Use of this soil for sewage lagoons is limited by wetness, flooding, and the hazard of seepage. Flood protection and sealing the bottom of the lagoon are helpful practices. Onsite investigations are essential to properly evaluate and plan the development of specific sites.

This soil has severe limitations for most recreation uses. Wetness is the main problem but can be overcome by using tile drains and surface ditches. Capability subclass IIw.

69—Milford silty clay loam. This level or nearly level, poorly drained soil is on upland flats and in depressions. Areas are irregular in shape and range from 5 to 700 acres in size.

Typically, the surface layer is black silty clay loam about 15 inches thick. The subsoil is about 38 inches thick. The upper part is mottled, very dark gray and dark gray silty clay; the middle part is mottled, gray silty clay loam; and the lower part is mottled, olive gray and gray silty clay loam. The underlying material, to a depth of 60 inches, is mottled, light gray and gray silty clay loam. In some areas the surface layer is thicker than typical. In places there is less clay in the subsoil and underlying material.

Included with this soil in mapping are small areas of somewhat poorly drained Elliott soils. They are on slight rises and make up less than 15 percent of the map unit.

Water and air move through this soil at a moderately slow rate, and surface runoff from cultivated areas is slow to ponded. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is neutral. Natural fertility is high, and organic-matter content is very high. The surface layer is friable but becomes compact and cloddy if tilled when wet. Available water capacity is high.

Most areas of this soil are farmed. The potential is good for crops and poor for most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Wetness is the main problem when this soil is used for cultivated crops. Tile drains and surface ditches improve drainage. If the soil is plowed in the fall and left bare, wind erosion may occur during winter and spring. Winter cover crops or conservation tillage helps reduce erosion. Returning crop residue and adding animal manure help to maintain good tilth and organic-matter content and improve fertility.

This soil is poorly suited to most urban uses. Depth to the seasonal water table is less than 1 foot. This soil is subject to occasional flooding and ponding. It lacks sufficient stability because it has high frost heave potential and the subsoil has high shrink-swell potential. Water moves downward through the subsoil at a moderately slow rate.

Areas of this soil used for urban development need to be artificially drained and protected from flooding. Dwellings with basements may be difficult or expensive to construct because of difficulty in lowering the water table. Dwellings without basements should be constructed with footings designed to withstand the shrinking and swelling. Drainage systems are needed to lower the water table. Use of this soil for streets and roads is limited by wetness, shrink-swell potential, and frost heave potential. Installation of drainage systems and use of fill material make this soil more suitable for streets and roads.

Conventional septic tank absorption fields should not be constructed because of wetness and moderately slow permeability. Sanitary facilities should be connected to

commercial sewers and treatment plants if possible. This soil is well suited to construction of sewage lagoons. Onsite investigation is essential to properly evaluate and plan the development of specific sites.

This soil has severe limitations for most recreation uses. Wetness is the main problem, but it may be overcome by using tile drains and surface ditches. The surface soil is subject to wind erosion. Proper placement of trees, shrubs, and other vegetation helps control erosion. Capability subclass IIw.

76—Otter silt loam. This nearly level or level, poorly drained soil is on flood plains and alluvial bottom lands adjacent to streams (fig. 8). Areas are linear and range from 20 to 100 acres in size.

Typically, the surface layer is black silt loam about 28 inches thick. The subsoil is mottled, dark grayish brown silt loam about 11 inches thick. The underlying material, to a depth of 60 inches, is calcareous, stratified, mottled, dark gray and gray silt loam and loam. In places the surface layer is thinner than typical and is silty clay loam. In places free carbonates are in the surface layer and subsoil. The underlying material contains sand and gravel in some areas.

Included with this soil in mapping are small areas of somewhat poorly drained Kane and Brenton soils and well drained and moderately well drained Proctor soils. These soils are on slight rises and make up 5 to 15 percent of the map unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow to ponded. Reaction in the surface layer varies with local liming practices, but is commonly neutral. The subsoil is neutral or mildly alkaline. Natural fertility is high, and organic-matter content is very high. The surface layer is friable but will become compact and cloddy if tilled when wet. Available water capacity is high.

Most areas of this soil are farmed or left in woodland, but some areas are used for urban development. The potential is good for crops and poor for most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Wetness is the main problem when this soil is used for cultivated crops. Tile drains and surface ditches improve drainage if a suitable outlet can be found. Areas need to be protected from flooding. If the soil is plowed in the fall and left bare, wind erosion may occur during winter and spring. Winter cover crops or conservation tillage help reduce erosion. Returning crop residue and adding animal manure help to maintain good tilth and organic-matter content and improve fertility.

This soil is [illegible] structed. Use of this soil for streets and roads is limited by wetness, flooding, and frost heave potential. Flood protection, installation of drainage systems, and use of fill material will make the soil more suitable for this use. Septic tank absorption fields should not be constructed because of wetness and flooding. Use of this soil for sewage lagoons is limited by wetness, flooding, and seepage. Flood protection and sealing the bottoms of lagoons are helpful practices. Onsite investigations are essential to properly evaluate and plan the development of specific sites.

This soil has severe limitations for most recreation uses. Wetness, the main problem, can be overcome by using tile drains and surface ditches. Game birds and songbirds will be attracted to these areas if proper habitat is provided. Capability subclass IIw.

82—Millington loam. This nearly level or level, poorly drained soil is on alluvial bottom lands adjacent to streams. Areas are linear and range from 10 to 150 acres in size.

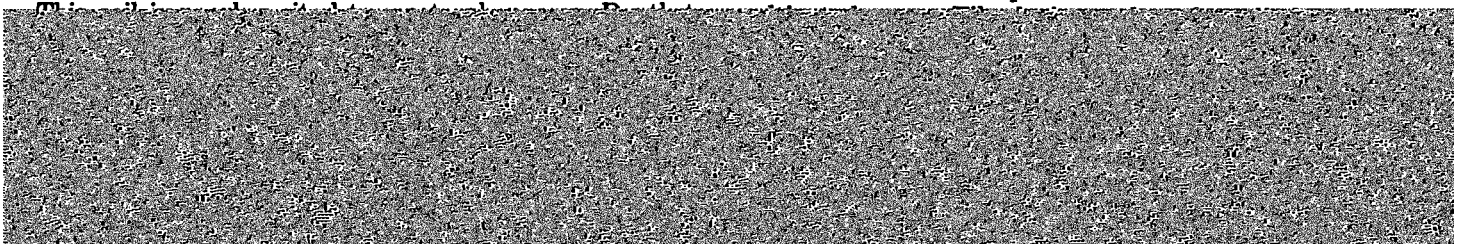
Typically, the surface layer is calcareous black loam and mottled, black silty clay loam about 28 inches thick. The subsoil is calcareous, stratified, mottled, very dark gray and black sandy loam and silty clay loam about 14 inches thick. The underlying material, to a depth of 60 inches, is calcareous, mixed dark grayish brown and light gray sandy loam and gravelly loam. In some places the surface layer is thinner and is silt loam or silty clay loam. In some areas the surface layer and subsoil do not contain free carbonates. Limestone bedrock is the underlying material in some areas along the Fox River.

Included with this soil in mapping are small areas of somewhat poorly drained Kane and Mundelein soils and well drained and moderately well drained Proctor soils. These soils are on slight rises and make up 5 to 10 percent of the unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow to ponded. The surface layer is commonly mildly alkaline. The subsoil is mildly alkaline or moderately alkaline. Natural fertility is high, and organic-matter content is very high. The surface layer is friable, but it becomes compact and cloddy if tilled when wet. The available water capacity is high.

Most areas of this soil are farmed or are left in woodland, but some areas are used for urban development. The potential is good for growing crops and poor for most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Wetness is the main problem when this soil is used for



This soil is poorly suited to most urban uses. Depth to the water table is frequently less than 1 foot. This soil is subject to frequent flooding. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. Water moves downward through the soil at a moderate rate.

Areas of this soil that are used for urban development must be artificially drained and protected from flooding. Dwellings, either with or without basements, should not be constructed. Use of this soil for streets and roads is limited by wetness, flooding, and frost heave potential. Flood protection, installation of drainage systems, and use of fill material are helpful practices. Septic tank absorption fields should not be constructed because of wetness and flooding. All sanitary facilities should be connected to commercial sewers and treatment plants. Use of this soil for sewage lagoons is limited by wetness, flooding, and seepage hazard, but it can be helped by flood protection and sealing the bottoms of lagoons. Onsite investigations are essential to properly evaluate and plan the development of specific sites.

This soil has severe limitations for most recreation uses. Wetness and flooding are the main concerns, but problems can be overcome by use of tile drains, surface ditches, and flood protection. Game birds and songbirds are attracted to these areas if proper habitat is provided. Capability subclass IIw.

93F—Rodman soils, 15 to 30 percent slopes. These moderately steep and steep, excessively drained soils are on kamic ridges and side slopes. Areas are long and narrow and range from 5 to 90 acres in size.

Typically, the surface layer is very dark gray sandy loam about 7 inches thick. The subsoil is brown to dark brown gravelly loam about 4 inches thick. The underlying material, to a depth of 60 inches, is brown to dark brown gravelly sand. In places the surface layer is lighter in

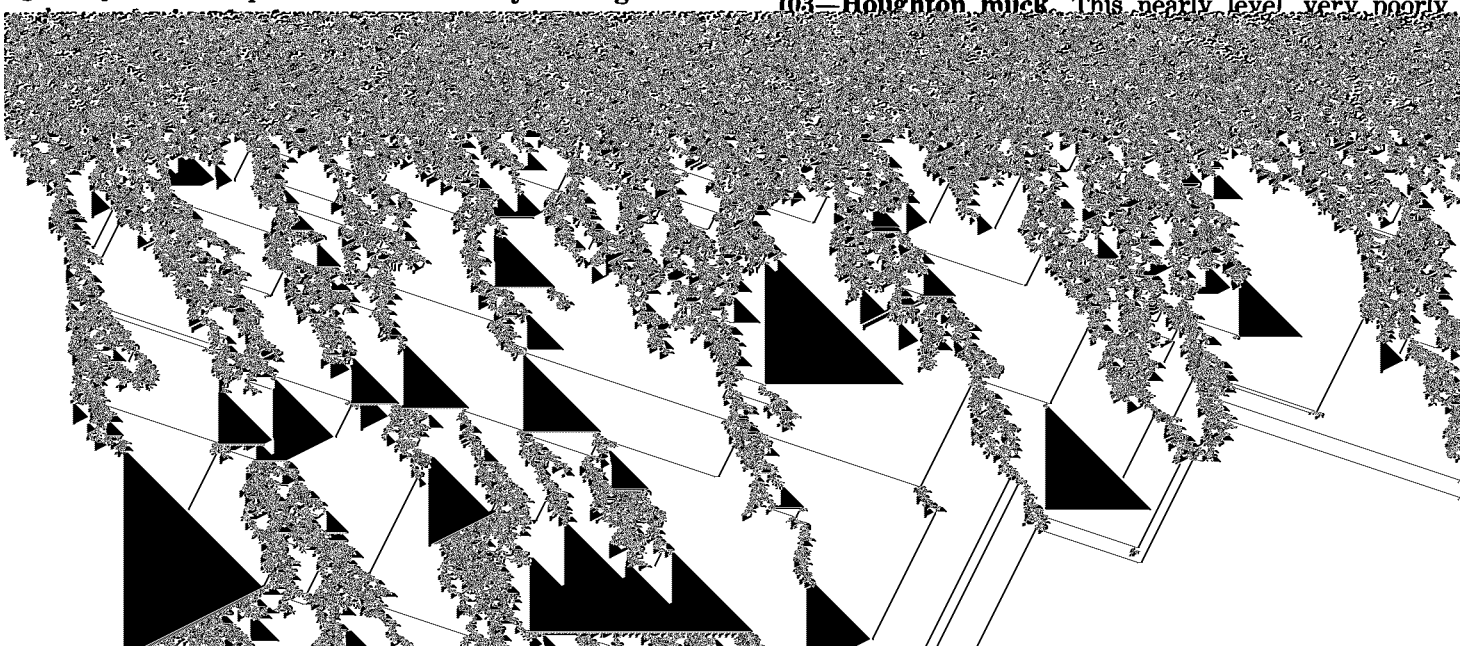
These soils are not suited to intensive use for row crops such as corn and soybeans because of droughtiness, slope, and erosion hazard. Careful management is needed to control erosion and maintain fertility and adequate plant cover. These soils are best suited to grasses and legumes grown for hay and pasture. Terracing and contouring are limited in some areas by irregular topography and by gravelly sand near the surface.

Forage can be produced on these soils. Overgrazing reduces plant vigor and often results in excessive runoff and erosion. Droughtiness is the main limiting factor in forage production. Proper stocking rates, pasture rotation, and limited grazing help to keep the pasture plants and soil in good condition and minimize soil erosion. Excessive slope may restrict the use of farm machinery in planting and harvesting.

These soils are not suited to most urban uses because of excessive slope. Alternative sites for urban development should be selected. The water table is usually below a depth of 6 feet. Water moves downward through the surface layer and subsoil at a moderately rapid rate and through the underlying material at a very rapid rate. Because of the very rapid permeability of the underlying material, there is a potential for pollution of ground water when sanitary facilities are installed.

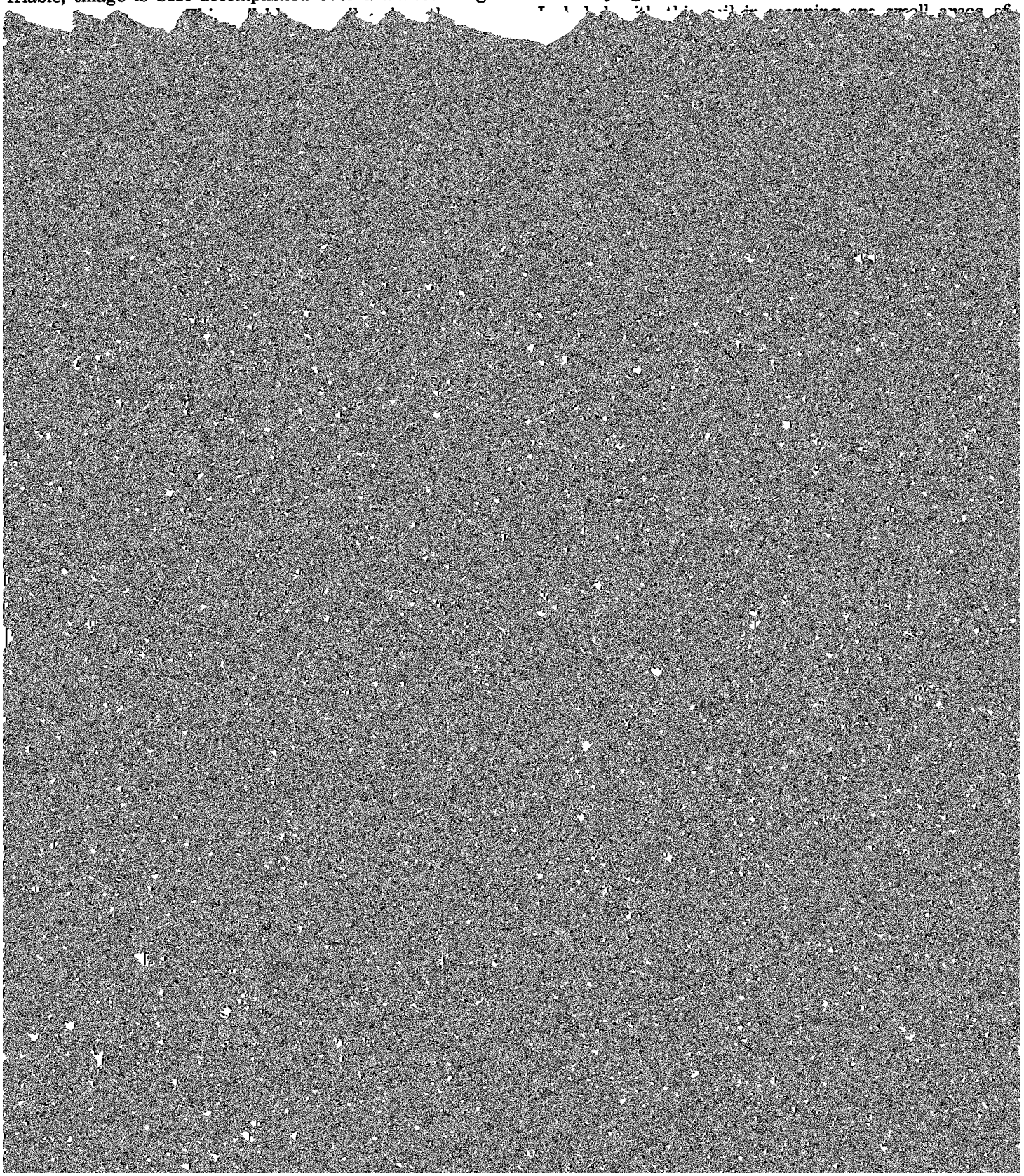
These moderately steep and steep soils are not suited to most recreation uses, but they are well suited to winter sports. Because of excessive slope, these soils are moderately limited for paths and trails. These soils are severely limited for use as camp or picnic areas; extensive leveling is required. Playgrounds should not be constructed. Proper placement of trees, shrubs, and other ornamentals and seeding grasses are important for controlling erosion. Also, proper vegetative cover attracts a variety of songbirds and other wildlife and provides a more attractive environment. Capability subclass VIIs.

103—Houghton muck. This nearly level, very poorly



matter content is very high. Although the surface layer is friable, tillage is best accomplished over a limited range

thinner. In some areas in the southern part of the county, the underlying material is calcareous loam till.



105A—Batavia silt loam, 0 to 2 percent slopes. This nearly level, well drained and moderately well drained soil is on knolls and broad, flat ridgetops on outwash plains. Areas are oval and range from 5 to 160 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsurface layer is dark grayish brown silt loam about 3 inches thick. The subsoil is about 44 inches thick. The upper part is brown to dark brown and dark yellowish brown silty clay loam; the middle part is yellowish brown, mottled silty clay loam; and the lower part is brown and yellowish brown, mottled clay loam and silt loam that contains strata of fine sandy loam. The underlying material, to a depth of 60 inches, is brown and yellowish brown stratified silt loam and sandy loam outwash. In places the surface layer is thicker and darker or thinner and lighter in color. In some areas stratified outwash material is closer to the surface, and the subsoil is thinner. In some areas thin layers of coarse sand and gravel are in the underlying material.

Included with this soil in mapping are small areas of somewhat poorly drained Virgil soils and poorly drained Drummer soils. These soils are in shallow depressions and drainageways. They make up 2 to 15 percent of the map unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow to medium. Reaction in the surface layer varies with local liming practices, but it is commonly neutral. The subsoil is neutral to medium acid. Natural fertility is high, and organic-matter content is moderate. Available water capacity is high. The surface layer is friable and easily tilled over a relatively wide range in moisture content.

Most areas of this soil are farmed, but some areas are used for urban development. The potential is good for crops and good to fair for most urban uses.

This soil is well suited to corn, soybeans, wheat, and oats, and it is well suited to grasses and legumes grown for hay and pasture. The soil has no major limitations for growing cultivated crops. Returning crop residue and adding animal manure help to maintain good tilth and organic-matter content and improve fertility. Conservation tillage is recommended for controlling wind erosion.

This soil is suited to urban development if proper design and installation procedures are used. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is usually below a depth of 4 feet. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of the lack of sufficient stability in the subsoil. This problem can be corrected by strengthening foundations, replacing the base material, and placing footings below the frost line. This soil is well suited to dwellings with basements. Frost heave is a concern when building streets and roads, but problems can be avoided by replacing subgrade material. This soil is well suited to septic tank absorption fields.

This soil is well suited to recreation uses. The nearly level surface, good drainage, and silt loam texture provide a firm surface that can withstand intensive foot traffic. This soil has no limitations for such uses as playgrounds, camp areas, picnic areas, trails, footpaths, and bridle paths. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability class I.

105B—Batavia silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained and well drained soil is on knolls and upland ridges of outwash plains. Areas are irregular in shape and range from 5 to 200 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsoil is about 41 inches thick. The upper part is dark yellowish brown silty clay loam, the middle part is yellowish brown silty clay loam, and the lower part is pale brown clay loam. The underlying material, to a depth of 60 inches, is stratified yellowish brown and pale brown silt loam and sandy loam. In places the surface layer is thicker and darker or thinner and lighter in color. In some areas stratified outwash is closer to the surface and the subsoil is thinner. Sand and gravel are in the underlying material in places.

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

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is medium. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is neutral to medium acid. Natural fertility is high, and organic-matter content is moderate. Available water capacity is high. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed, but some areas in the eastern part of the county are used for urban development. The potential is good for crops and good to fair for most urban uses.

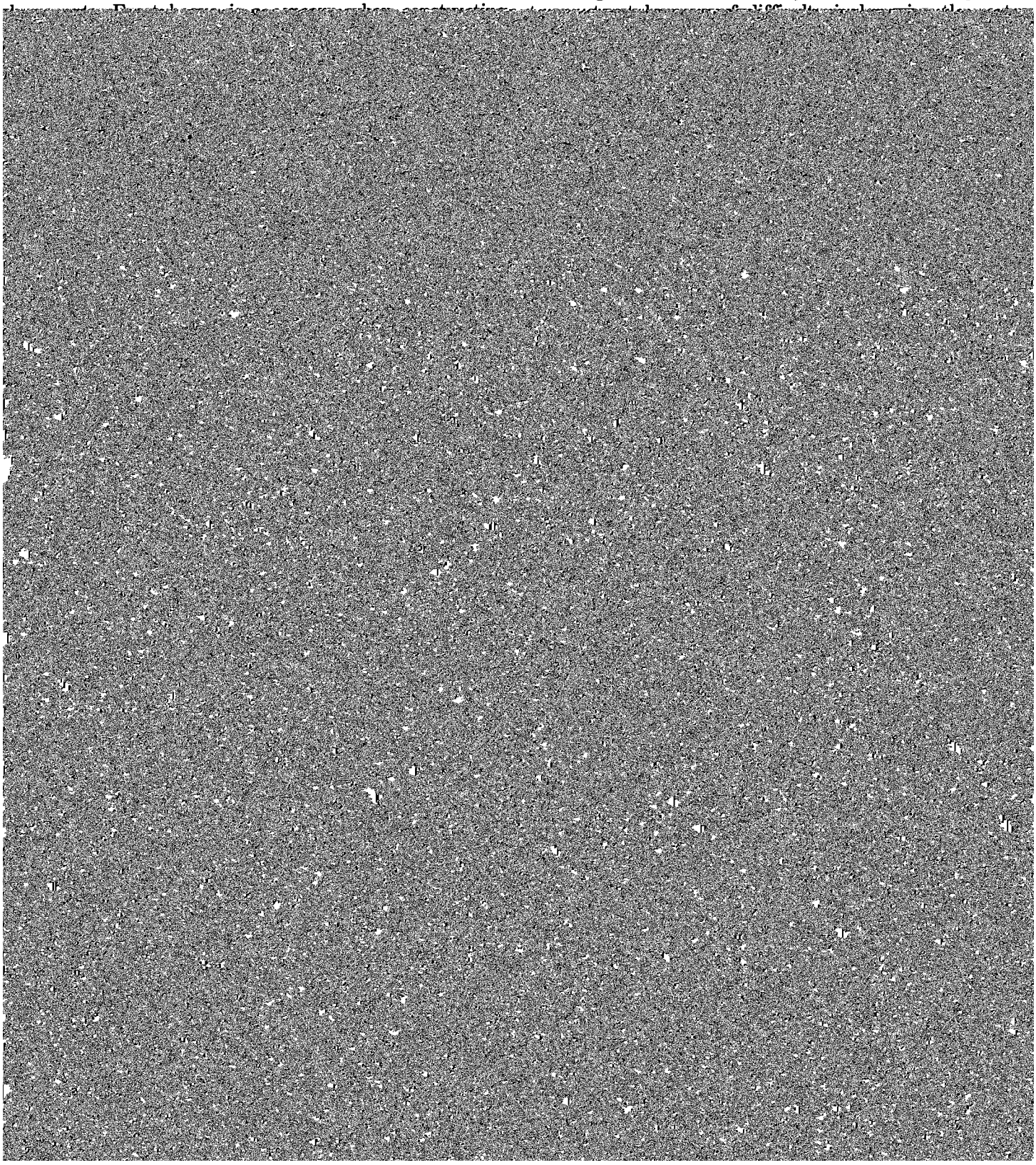
This soil is suited to corn, soybeans, wheat, oats, and grasses and legumes grown for hay and pasture. Erosion is the main hazard if this soil is used for cultivated crops. Minimum tillage and winter cover crops help to control erosion. In a few areas slopes are long enough and smooth enough for terracing and contouring. Returning crop residue and adding animal manure help to maintain organic-matter content, improve fertility and soil tilth, increase water infiltration, and reduce soil loss.

This soil is suited to urban development if proper design and installation procedures are used. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is usually below a depth of 4 feet. Water moves downward through the soil at a moderate rate.

This soil is moderately suited to dwellings without basements because of the lack of sufficient stability in the

subsoil, but problems can be avoided by strengthening or replacing the base material and putting footings below the frost line. This soil is well suited to dwellings with

Areas of this soil that are used for urban development must be artificially drained and protected from flooding. Dwellings with basements may be difficult or expensive



This soil is well suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. No major soil limitations restrict the growing of cultivated crops. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and soil tilth, increase the rate of water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is usually below a depth of 6 feet. Water moves downward through this soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of the lack of sufficient stability in the subsoil. Problems can be avoided by strengthening or replacing the base material and by placing foundation footings below frost level. This soil is well suited to dwellings with basements. Frost heave is a concern when constructing streets and roads, but problems can be avoided by replacing subgrade material. This soil is well

from neutral to strongly acid. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range in moisture content; however, it has a tendency to crust or puddle after hard rains.

Most areas of this soil are farmed, but some areas in the eastern part of the county are used for urban development. The potential is good for crops and good to fair for most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is used for growing cultivated crops. Conservation tillage and winter cover crops help to control erosion. In a few areas slopes are long enough and smooth enough for terracing and contouring. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and soil tilth, increase the rate of water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. It lacks suffi-

tain more sand or the underlying material is gravelly sand. In some small areas where the upper part of the subsoil has been mixed with the surface layer by tillage, the surface soil is brown silty clay loam.

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

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is rapid. Reaction in the surface layer varies with local liming practices, but is commonly neutral. The subsoil ranges from neutral to strongly acid. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range in moisture content; however, it has a tendency to crust or puddle after hard rains, especially in areas where the plow layer contains subsoil material.

Most areas of this soil are farmed, but some areas in the eastern part of the county are used for urban development. The potential is good to fair for crops and most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if this soil is used for growing cultivated crops. Poor tilth is also a limitation. Conservation tillage, terracing, contouring, and grassed waterways reduce soil loss. Returning crop residue to the soil and adding animal manure help maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is usually below a depth of 6 feet. Water

soil is on broad ridgetops and knolls on ground moraines. Areas are irregular in shape and range from 10 to 260 acres in size.

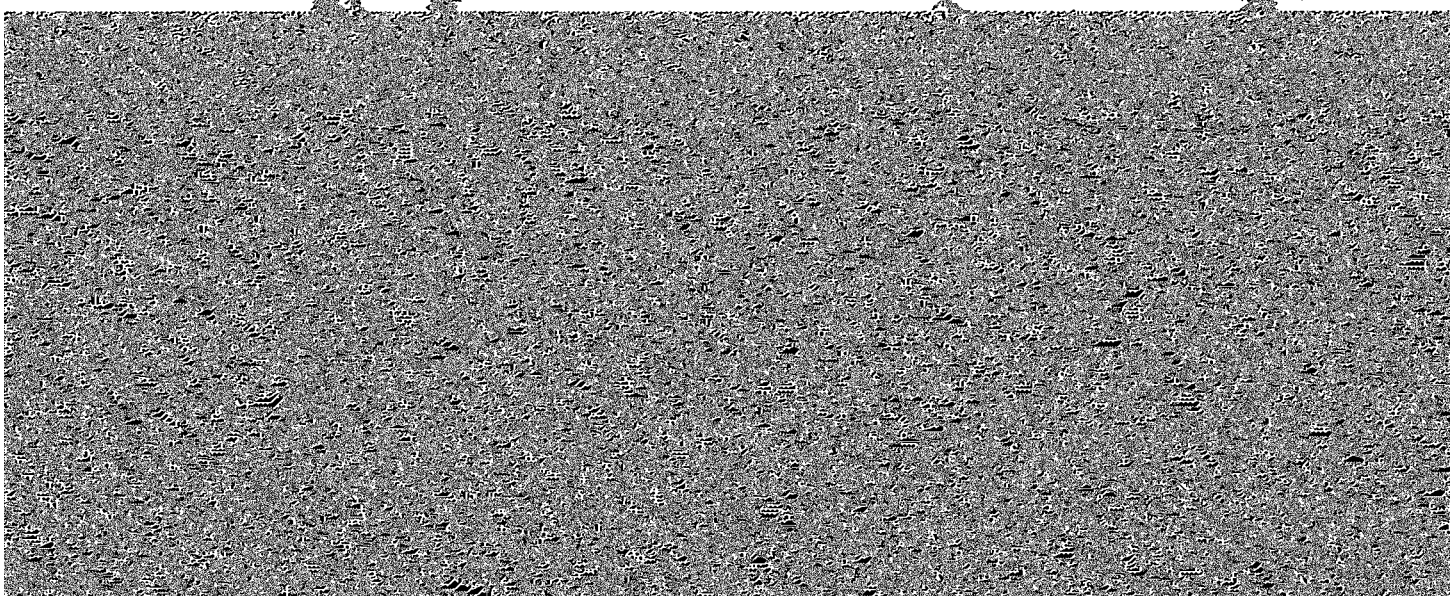
Typically, the surface layer is very dark gray silt loam about 11 inches thick. The subsoil is about 25 inches thick. The upper part is brown to dark brown silty clay loam and the lower part is brown to dark brown and yellowish brown clay loam. The underlying material, to a depth of 60 inches, is yellowish brown calcareous loam. In places the subsoil is thicker and depth to calcareous loam till is greater. In some areas the lower part of the subsoil and underlying material contain stratified sandy loam and silt loam outwash. Also, in places in the western part of the county, the surface layer is thinner than typical.

Included with this soil in mapping are small areas of somewhat poorly drained Lisbon soils and poorly drained Drummer soils. These soils are in shallow depressions and drainageways and make up 5 to 15 percent of the map unit.

Water and air move through this soil at a moderate rate, and surface runoff is slow or medium. Reaction ranges from neutral to medium acid in the subsoil and from neutral to slightly acid in the surface layer, depending on local liming practices. Natural fertility, organic-matter content, and available water capacity are high. The surface layer is friable and easily tilled through a fairly wide range of moisture content.

Most areas of this soil are farmed. The potential is very good for cultivated crops, hay, pasture, and trees and good to fair for most urban uses.

This soil is well suited to corn, soybeans, and small grain, and it is well suited to grasses and legumes grown for hay and pasture. Conservation tillage, winter cover crops, and grassed waterways help keep soil loss at a minimum. Returning crop residue or the regular addition of other organic material helps maintain fertility and increase water intake.



playgrounds, camp areas, picnic areas, trails, footpaths, and bridle paths. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability class I.

145B—Saybrook silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained and well drained soil is on convex ridges, knolls, and short, uneven side slopes in areas of ground moraines. Mapped areas are irregular in shape and range from 5 to 160 acres in size.

Typically, the surface layer is black silt loam about 13 inches thick. The subsoil is about 28 inches thick. The upper part is brown to dark brown silt loam and silty clay loam, the middle part is brown to dark brown clay loam, and the lower part is yellowish brown loam. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown loam till. In places the surface layer is thinner and lighter in color. In some areas the underlying calcareous loam till is deeper than typical and the subsoil is thicker. In some places the underlying material contains stratified sandy loam and silt loam outwash.

Included with this soil in mapping are small areas of somewhat poorly drained Lisbon soils and poorly drained Drummer soils. These soils are in shallow depressions and drainageways and make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is medium. Reaction in the surface layer varies with local liming practices, but it is commonly neutral or slightly acid. The subsoil ranges from mildly alkaline to medium acid. Natural fertility, available water capacity, and organic-matter content are high. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed. The potential is good for crops and good to fair for most urban uses. This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is used for growing cultivated crops. Conservation tillage and winter cover crops help to control erosion. In a few areas slopes are long enough and smooth enough for terracing and contouring. Returning crop residue to the soil and adding animal manure help to

suited to septic tank absorption fields. In places the rate of water movement in the subsoil is a concern, but problems can be avoided by increasing the size of the absorption field.

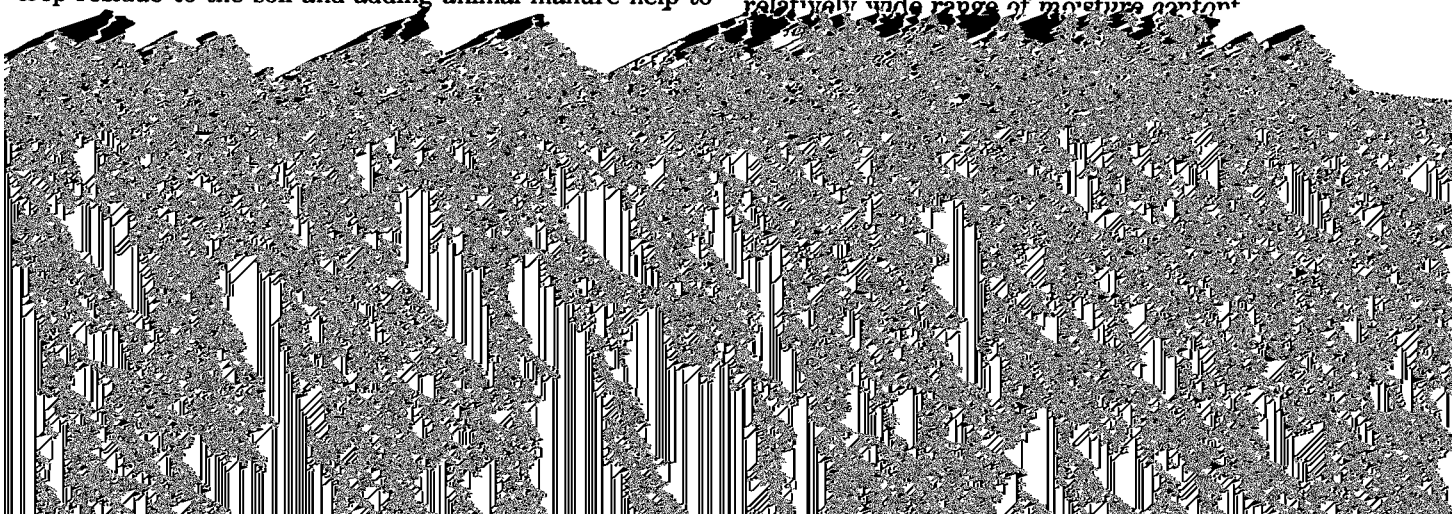
This soil is well suited to most recreation uses. Good drainage and the silt loam texture provide a firm surface that can withstand heavy foot traffic. No limitations restrict the use of this soil for camp areas, picnic areas, trails, footpaths, and bridle paths. Some leveling may be required, however, before the area is suited to playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIe.

145C2—Saybrook silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained and well drained soil is on sides of ridges and on knolls and convex ridgetops. Areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is very dark gray silt loam about 10 inches thick. The subsoil is about 21 inches thick. The upper part is brown to dark brown silty clay loam; and the lower part is dark brown and reddish brown clay loam. The underlying material, to a depth of 60 inches, is calcareous, reddish brown loam till. In places the surface layer is thinner and lighter in color and the upper part of the subsoil has been mixed with it through tillage. Also, in some areas depth to the calcareous underlying material is greater and the subsoil is thicker. The underlying material contains some stratified sandy loam and silt loam outwash in places.

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

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is medium. Reaction in the surface layer varies with local liming practices but is commonly slightly acid. The subsoil ranges from neutral to medium acid. Natural fertility, organic-matter content, and available water capacity are high. The surface layer is friable and easily tilled over a relatively wide range of moisture content.



This soil is only moderately suited to dwellings without basements because of the lack of sufficient stability in the subsoil, but problems can be avoided by strengthening or replacing the base material. This soil is well suited to dwellings with basements. Frost heave is a concern when constructing streets and roads, but problems can be minimized by replacing subgrade material. Some grading may also be necessary. This soil is well suited to installation of septic tank absorption fields. The rate of water movement in the subsoil may be a concern, but problems can be avoided by increasing the size of the absorption field.

This soil is suited to most recreation uses. Good drainage and the silt loam texture provide a firm surface that can withstand heavy foot traffic. Few limitations restrict construction and use of camp areas, picnic areas, trails, footpaths, and bridle paths. Leveling is needed before these areas can be used for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to control wind and water erosion. Capability subclass IIIe.

146—Elliott silt loam. This nearly level, somewhat poorly drained soil is in upland drainageways, in shallow depressions, and on broad, low-lying ridges of end moraines. Areas are irregular in shape and range from 5 to 120 acres in size.

Typically, the surface layer is black and very dark gray silt loam about 12 inches thick. The subsoil is about 23 inches thick. The upper part is mottled, dark grayish brown silty clay loam; the middle part is mottled, brown to dark brown silty clay loam; and the lower part is mottled, olive brown and light olive brown silty clay loam. The underlying material, to a depth of 60 inches, is mottled, light olive brown, calcareous silty clay loam. In places the surface layer is thinner and lighter in color. In some areas calcareous silt loam is in the underlying material.

Included with this soil in mapping are small areas of well drained Varna soils and poorly drained Milford soils. Varna soils are on upland ridges, and Milford soils are in depressions. These soils make up 5 to 15 percent of the map unit.

Water and air move through this soil at a moderately slow rate, and surface runoff from cultivated areas is slow to medium. Reaction in the surface layer varies with local liming practices, but it is commonly neutral. The subsoil ranges from slightly acid to mildly alkaline. Natural fertility and organic-matter content are high. The surface layer is friable, but it becomes cloddy if tilled when wet.

Most areas of this soil are farmed. The potential is fair for crops and poor to fair for most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Wetness may be a concern when the soil is used for cultivated crops. Where wetness is a limitation, tile drains and shallow surface ditches can be used to improve drainage. Returning crop residue to the soil and adding animal manure help to maintain tilth and organic-matter content and improve fertility.

This soil can be made suitable for some urban uses. Depth to the seasonal water table is 1 to 3 feet. This soil lacks sufficient stability because of the high frost heave potential. Water moves through the soil at a moderately slow rate.

This soil is poorly suited to dwellings because of wetness. The water table can be lowered by installing tile drains. It is more difficult to lower the water table to a desired depth for construction of dwellings with basements than it is for dwellings without basements. Frost heave is a concern when constructing streets and roads but can be minimized by replacing subgrade material. Use of this soil for septic tank absorption fields is limited by wetness and slow percolation in the subsoil and underlying material. Adding fill material, increasing the size of absorption fields, and constructing subsurface drainage systems improve its suitability. Where possible, sanitary facilities should be connected to commercial sewers and treatment plants. This soil is well suited to sewage lagoons.

This soil is moderately suited to most recreation uses. Wetness, the main problem, can be overcome through the use of tile drains or shallow surface ditches. The use of trees, shrubs, and other vegetation reduces dust. Capability subclass IIw.

148A—Proctor silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained and well drained soil is on broad, flat ridgetops and knolls on outwash plains. Areas are irregular or long and narrow and range from 5 to 200 acres in size.

Typically, the surface layer is black and very dark gray silt loam about 13 inches thick. The subsoil is about 35 inches thick. The upper part is brown to dark brown silty clay loam, and the lower part is dark yellowish brown silty clay loam and loam. The underlying material, to a depth of 60 inches, is yellowish brown stratified, calcareous loam and silt loam outwash. In places the surface layer is thinner and lighter in color. In some areas depth to the underlying material is greater and the subsoil is thicker, and in other places calcareous loam till is in the underlying material.

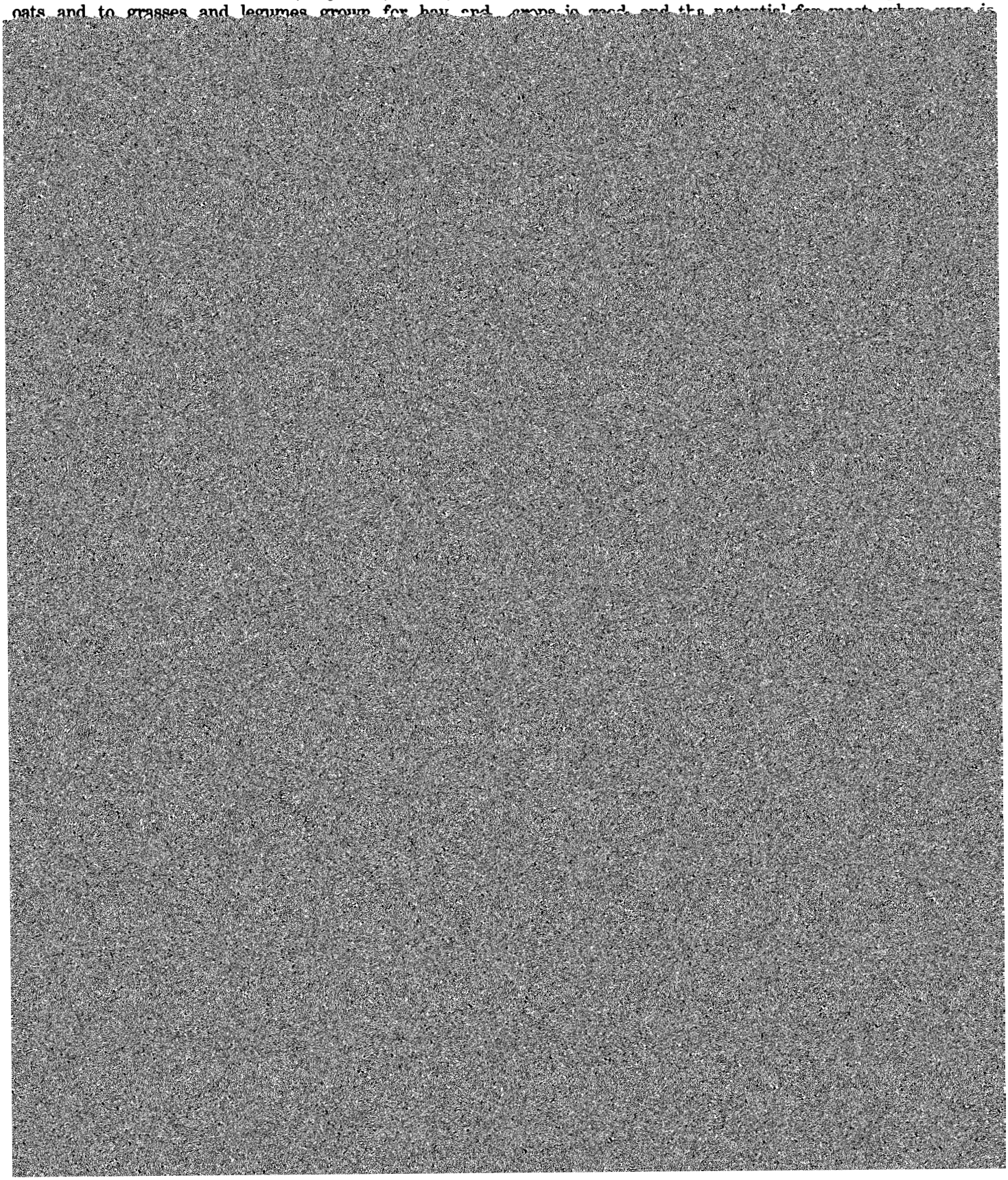
Included with this soil in mapping are small areas of somewhat poorly drained Brenton soils and poorly drained Drummer soils. These soils are in shallow depressions and drainageways and make up 5 to 15 percent of the map unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow. Reaction in the surface layer varies with local liming practices but it is commonly slightly acid. The subsoil is slightly acid or neutral. Natural fertility and organic-matter content are high. The surface layer is friable and easily tilled over a relatively wide range of moisture content. Available water capacity is high.

Most areas of this soil are farmed, but some areas are used for urban development. The potential is good for crops and good to fair for most urban uses.

This soil is well suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and

Most areas of this soil are farmed. The potential for crops is good, and the potential for most other uses is



Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow to medium. Reaction in the surface layer varies with local liming practices, but it is commonly neutral. The subsoil is slightly acid or neutral. Natural fertility and organic-matter content are high. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed, but some areas in

Typically, the surface layer is black silty clay loam about 13 inches thick. The subsoil is about 37 inches thick. The upper part is mottled, very dark gray and dark gray silty clay loam; the middle part is mottled, grayish brown silty clay loam; and the lower part is mottled, gray sandy loam. The underlying material, to a depth of 70 inches, is mottled, gray and grayish brown sandy loam and loam. In places free carbonates are in the surface layer and subsoil. In some areas there is a silt loam subsurface layer 6

vestigations are essential to properly evaluate and plan the development of specific sites.

This soil has severe limitations for most recreation uses. Wetness is the main concern, but can be reduced

ing subgrade material. Use of this soil for septic tank absorption fields is limited by wetness. It can be improved by adding fill material, increasing the size of the absorp-

Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings with or

long enough and smooth enough for terracing and contouring. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content.

face layer is friable, but it is sticky when wet and hard and cloddy when dry. Moisture conditions are best for cultivation when the soil is neither saturated nor excessively dry. In places root development is somewhat restricted in the underlying material by the compact silty clay loam till.

Some areas of this soil are farmed; however, most areas in the eastern part of the county are used for urban development. Potential is good for crops and fair for most urban uses.

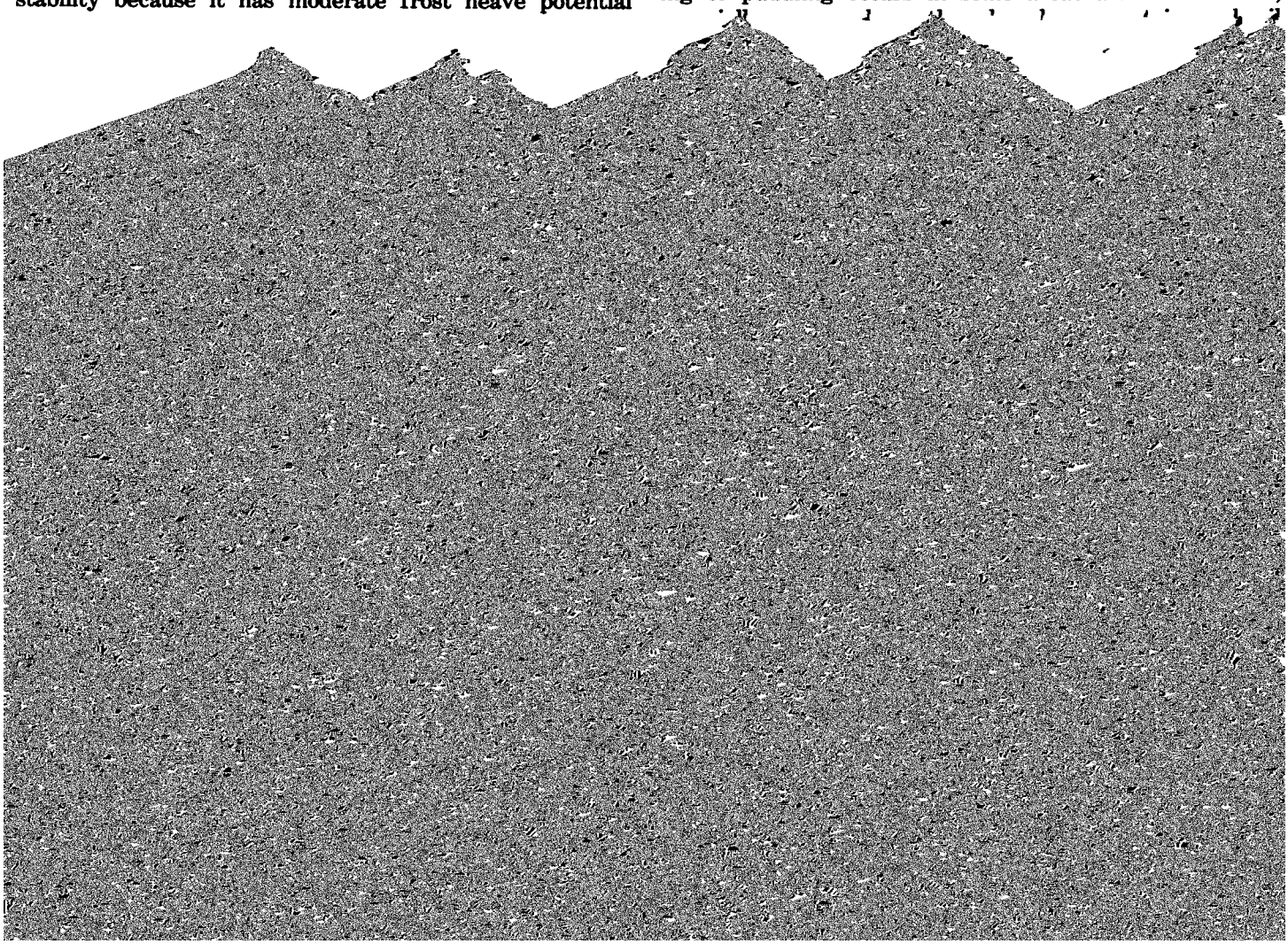
This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and pasture. Erosion is the main hazard when this soil is used for cultivated crops. Conservation tillage and winter cover crops help to control erosion. In a few areas slopes are long enough and smooth enough for terracing and contouring. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and soil tilth, increase water infiltration, and reduce soil loss.

This soil is suited to many urban uses if proper design and installation procedures are used. It lacks sufficient stability because it has moderate frost heave potential

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil is about 30 inches thick. The upper part is brown to dark brown heavy silty clay loam; and the lower part is mottled, yellowish brown silty clay loam. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown silty clay loam till. In places the surface layer is thicker and darker or the underlying material contains stratified loamy outwash. Sand and gravel are in the underlying material in places.

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

Water and air move through this soil at a moderately slow or slow rate, and surface runoff from cultivated areas is rapid. Reaction in the surface layer varies with local liming practices, but it is commonly neutral. The subsoil is slightly acid or neutral. Natural fertility is medium, and organic-matter content is low. Available water capacity is high. The surface layer is friable, but it is sticky when wet and hard and cloddy when dry. Crusting or puddling occurs in some areas after hard rains,



underlying material limits the use of septic tank absorption fields. Increasing the size of the absorption field and adding more porous soil material are helpful practices. Suitability for sewage lagoons is limited by slope.

This soil is suited to recreation uses. It has few limitations for picnic areas, footpaths, trails, and bridle paths. The moderately slow to slow movement of water through this soil limits its use for camp areas and playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust and soil loss. Capability subclass IIIe.

194D—Morley silt loam, 10 to 15 percent slopes. This strongly sloping, moderately well drained and well drained soil is on side slopes, knolls, and convex ridges. Areas of this unit are irregular in shape and range from 5 to 75 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 5 inches thick. The subsurface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is about 26 inches thick. The upper part is brown to dark brown silty clay loam, and the lower part is yellowish brown silty clay loam that contains dolomitic cobbles and pebbles. The underlying material, to a depth of 60 inches, is yellowish brown, calcareous silty clay loam till. In places sand and gravel are in the underlying material. Much of the surface layer is eroded in some areas.

Included with this soil in mapping are small areas of somewhat poorly drained Beecher soils and poorly drained Milford soils. These soils are in shallow depressions and drainageways. They make up less than 10 percent of the map unit. Also included are areas of Urban land.

Water and air move through this soil at a moderately slow or slow rate, and surface runoff from cultivated areas is rapid. Reaction in the surface layer varies with local liming practices, but it is commonly neutral. The subsoil is neutral to medium acid. Natural fertility is medium, and organic-matter content is low. Available water capacity is high. The surface layer is friable, but it is sticky when wet and hard and cloddy when dry. The ideal moisture condition for cultivation is when the soil is neither saturated with water nor excessively dry. Crusting or puddling occurs in some areas after hard rains, especially where the plow layer contains subsoil material. Root development is somewhat restricted in the underlying material by the compact silty clay loam till.

Most areas of this soil are in timber or pasture, but

This soil is suited to urban development if proper design and installation procedures are used. It lacks sufficient stability because it has moderate frost heave potential and the subsoil has moderate shrink-swell potential. The water table is generally below a depth of 5 feet. Water moves downward through the soil at a moderately slow or slow rate. Measures to control erosion are necessary on construction sites.

This soil is only moderately suited to dwellings with or without basements because of the lack of sufficient stability in the subsoil and because of slope. Problems can be avoided by strengthening or replacing the base material and by leveling. Frost heave and shrink-swell potential are concerns when constructing streets and roads but can be minimized by replacing the subgrade material. Grading may also be required. This soil is poorly suited to septic tank absorption fields. The rate of water movement in the subsoil and the degree of slope are the main problems. Special design is needed to provide a septic system that will function properly. This soil is not suited to sewage lagoons because of excessive slope.

This soil is suited to some recreation uses. Few limitations restrict the use of this soil for footpaths, trails, and bridle paths. Moderately slow to slow permeability and strong slopes limit its use for camp and picnic areas. Leveling is required to make this soil suitable for picnic areas. Leveling and the addition of fill material are needed when constructing camp areas. Playgrounds are not recommended on this soil. Proper placement of trees, shrubs, and other vegetation slows surface runoff and curtails erosion. This soil is well suited to winter sports. Capability subclass IVe.

194E—Morley silt loam, 15 to 20 percent slopes. This moderately steep, moderately well drained and well drained soil is on narrow ridges and side slopes on end moraines. Areas are long and narrow and irregular in shape and range from 5 to 25 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 4 inches thick. The subsurface layer is brown silt loam about 4 inches thick. The subsoil is about 17 inches thick. The upper part is yellowish brown silty clay loam, the middle part is brown to dark brown silty clay, and the lower part is reddish brown silty clay loam that contains dolomitic pebbles and cobbles. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown silty clay loam. In places sand and gravel

Available water capacity is high. The surface layer is friable, but it is sticky when wet and hard and cloddy when dry. In some areas crusting or puddling occurs after hard rains, especially where the plow layer contains subsoil material.

Most areas of this soil are in timber or pasture, but some areas are used for urban development.

Because of the slope and a severe erosion hazard, this soil is not suited to intensive use for such row crops as corn and soybeans. Careful management is needed to control erosion and maintain fertility and good tilth. This soil is best suited to grasses and legumes grown for hay and pasture. Use of such conservation practices as terracing and contouring are restricted in some areas by irregular relief.

This soil is poorly suited to urban development because of excessive slope. It lacks sufficient stability because it has moderate frost heave potential and the subsoil has moderate shrink-swell potential. The water table is generally below a depth of 5 feet. Water moves downward through the soil at a moderately slow or slow rate.

Alternative sites should be selected for urban development when possible, and the areas should be planted to trees, shrubs, and other ornamentals to minimize erosion. Erosion needs to be controlled, especially in areas adjacent to less sloping soils that are under development. Construction on areas of this soil, although not advised, requires special engineering design to overcome slope limitations.

This soil is not suited to most recreation uses. Its use for paths and trails is moderately limited by excessive slope, and its use for camp and picnic areas is severely limited. Extensive leveling is required to make this soil suitable for camp or picnic areas. Playgrounds should not be constructed. Proper placement of trees, shrubs, and other vegetation is important for controlling erosion.

Included with this soil in mapping are small areas of well drained and moderately well drained Plano soils on upland ridges and poorly drained Drummer soils in drainageways and depressions. They make up less than 15 percent of the unit.

Water and air move through this soil at a moderate rate, and surface runoff from cultivated areas is slow. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is mildly alkaline to slightly acid. Available water capacity, natural fertility, and organic-matter content are high. The surface layer is friable and easily tilled over a relatively wide range in moisture content.

Most areas of this soil are farmed, but some areas are used for urban development. The potential is very good for crops and fair to poor for most urban uses.

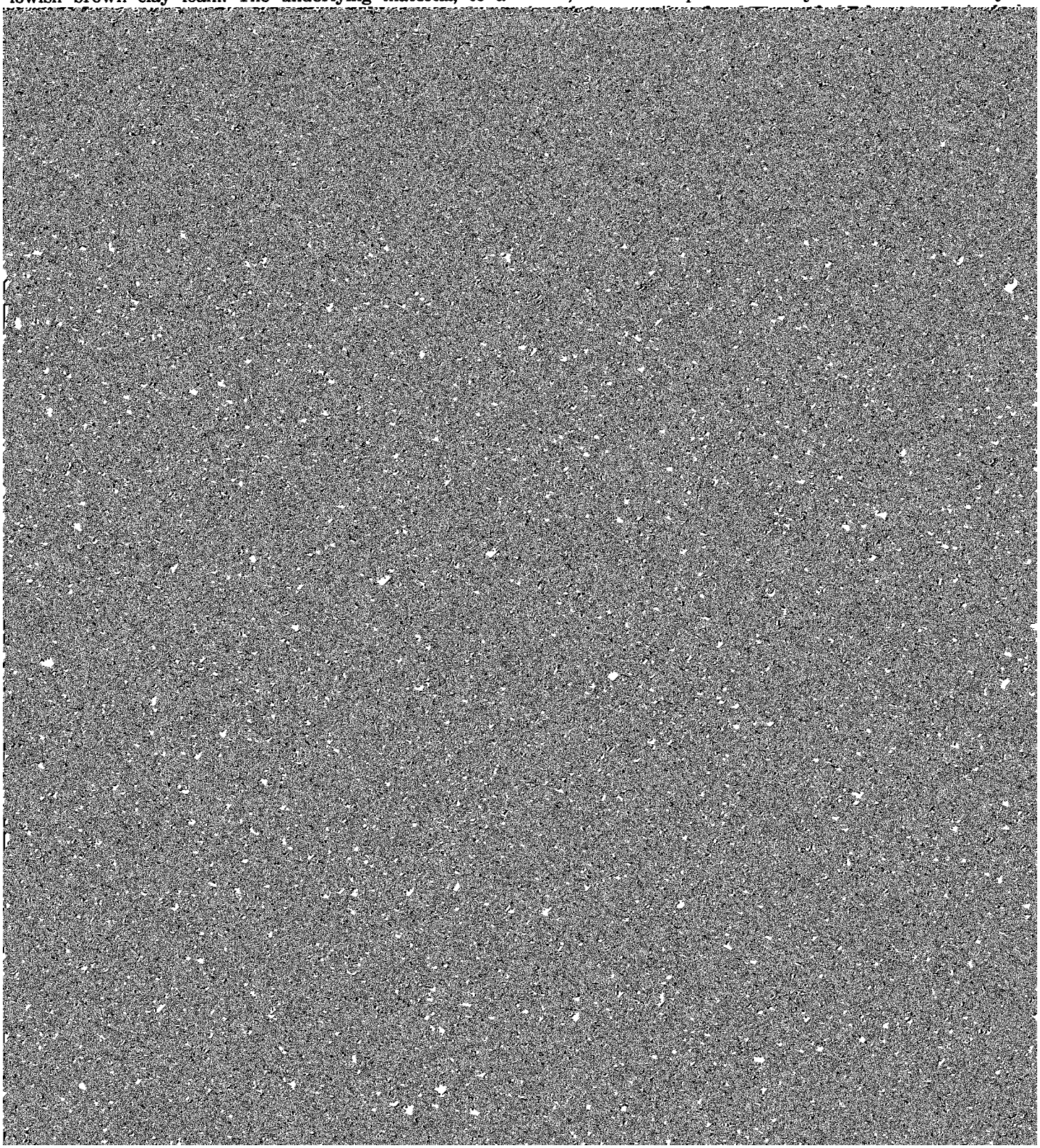
This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Wetness is a concern when this soil is used for cultivated crops, but tile drains and shallow surface ditches can be installed to improve drainage. Returning crop residue to the soil and adding animal manure help to maintain tilth and organic-matter content and improve fertility.

This soil is suited to many urban uses if proper design and installation procedures are used. Depth to the seasonal water table is 1 to 3 feet. This soil lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of wetness and the lack of sufficient stability in the subsoil. The water table can be lowered by installing tile drains. Stability can be improved by strengthening or replacing the base material. It is more difficult to lower the water table for construction of dwellings with basements. Frost heave is a concern when

inches thick. The upper part is brown to dark brown and yellowish brown silty clay loam, the middle part is yellowish brown silty clay loam, and the lower part is yellowish brown clay loam. The underlying material, to a

Typically, the surface layer is black and very dark gray silt loam about 15 inches thick. The subsoil is about 43 inches thick. The upper part is brown to dark brown silt loam, the middle part is dark yellowish brown and yel-



playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather and helps to control soil loss. Capability subclass IIe.

206—Thorp silt loam. This level, poorly drained soil is in depressions on outwash plains. Areas are rounded and range from 3 to 20 acres in size.

Typically, the surface layer is very dark gray silt loam

constructed. Instead, sanitary facilities should be connected to commercial sewers and treatment plants. Use of this soil for sewage lagoons is limited by wetness, flooding, and seepage. Flood protection and sealing the bottoms of lagoons make it more suitable. Onsite investigations are essential to properly evaluate and plan the development of specific sites.

suited to streets and roads because of low strength and stability, wetness, and flooding. Sanitary facilities should not be placed on this soil because of wetness, flooding

tile drains. Stability can be improved by strengthening or replacing the base material. It is more difficult, however, to lower the water table to a desired depth for construc-

soil and adding animal manure help to maintain organic-matter content, improve fertility, improve soil tilth, in-

This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and

Water and air move through this soil at a moderate rate and runoff from cultivated areas is medium. A profile

brown silty clay loam, and the lower part is mottled, brown and yellowish brown loam. The underlying material

trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIe.

233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on ridges and uneven side slopes on ground moraines. Areas are irregular in shape and range from 10

this can be corrected by increasing the size of the absorption field.

This soil is suited to most recreation uses. Good drainage and silt loam soil texture provide a firm surface, which is required for heavy foot traffic. Few limitations restrict the use of this soil for campsites, picnic areas,

tial. Water moves downward through the soil at a moderately slow rate.

This soil is only moderately suited to dwellings without basements because of wetness and the lack of sufficient stability and strength in the subsoil. The water table can be lowered by installing tile, and stability and strength can be improved by replacing or strengthening base material. Use of this soil for dwellings with basements is limited by wetness. It is more difficult to lower the water table to a desired depth for construction of dwellings with basements. Frost heave is a concern when constructing streets and roads, but conditions can be improved by replacing the subgrade material. Use of this soil for conventional septic tank absorption fields is limited by wetness and the slow percolation in the subsoil and underlying material. Adding fill material, enlarging the absorption field, and constructing subsurface drainage systems are ways to improve suitability for septic tank absorption fields. Where possible, sanitary facilities should be connected to commercial sewers and treatment plants. This soil is well suited to sewage lagoons.

This soil is only moderately suited to most recreation uses. Wetness is the main concern, but problems can be overcome by using tile drains or digging shallow surface ditches. Proper placement of trees, shrubs, and other vegetation reduces dust. Capability subclass IIw.

243A—St. Charles silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained and well drained soil is on broad ridgetops on outwash plains. Areas are long and broad and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown silt loam about 4 inches thick. The subsurface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is about 52 inches thick. The upper part is yellowish brown silty clay loam, and the lower part is yellowish brown sandy clay loam. The underlying material, to a depth of 70 inches, is stratified sandy loam and silt loam outwash. In places the surface layer is thicker and darker. The underlying material is closer to the surface in some places, and the subsoil is thinner. In some areas calcareous sand and gravel are in the underlying material.

Included with this soil in mapping are small areas of somewhat poorly drained Virgil soils and poorly drained Drummer soils. They occupy shallow depressions and drainageways and make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate, and runoff from cultivated areas is slow. Available water capacity is high. The subsoil is strongly acid. Reaction in the surface layer varies with local liming practices but is commonly neutral. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range of moisture content. In places it has a tendency to crust or become puddled, however, after hard rains, especially where the plow layer contains material from the subsoil.

Most areas of this soil are farmed, although some areas development. The potential for crops is good, and the potential for most urban uses is good to fair.

This soil is well suited to corn, soybeans, wheat, and oats. It is also well suited to grasses and legumes grown for hay and pasture. No major limitations restrict the use of this soil for cultivated crops. There is a tendency for crust to form on the surface. This tendency can be reduced by conservation tillage. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce erosion.

This soil is suited to urban development if proper design and installation procedures are used. It lacks stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is generally at a depth of more than 5 feet. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of the lack of sufficient stability in the subsoil, but problems can be avoided by strengthening or replacing the base material or placing footings below frost level. This soil is well suited to dwellings with basements. Frost heave is a concern when constructing streets and roads, but problems can be avoided by replacing the subgrade material. The soil is well suited to septic-tank absorption fields.

This soil is well suited to recreation uses. The nearly level surface, good drainage, and silt loam soil texture provide the firm surface required for intensive foot traffic. No limitations restrict the use of this soil for playgrounds, campsites, picnic areas, trails, footpaths, and bridle paths. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability class I.

243B—St. Charles silt loam, 2 to 5 percent slopes. This gently sloping, well drained and moderately well drained soil is on broad ridgetops and side slopes on outwash plains. Areas are oval and range from 10 to 90 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil is about 57 inches thick. The upper part is brown to dark brown and dark yellowish brown silty clay loam, and the lower part is mixed brown to dark brown and yellowish brown sandy clay loam and sandy loam. The underlying material, to a depth of 70 inches, is stratified yellowish brown and dark yellowish brown sand and loamy sand outwash. In places sandy outwash is closer to the surface or the surface layer is thick and darker. In some areas the underlying material is calcareous sand and gravel. Some areas in the southwestern part of the county have calcareous loam till in the underlying material.

Included with this soil in mapping are small areas of somewhat poorly drained Virgil soils and poorly drained Drummer soils in shallow depressions and drainageways. They make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate

ble water capacity is high. Reaction varies in the surface layer as a result of local liming practices, but is commonly neutral. The subsoil is slightly acid to strongly acid. Natural fertility is medium, and the organic-matter content is low. The surface layer is friable and easily tilled over a fairly wide range of moisture content. It does, however, have a tendency to crust or become puddled after hard rains, especially where the plow layer contains subsoil material.

Most areas of this soil are farmed. This soil has good potential for cultivated crops, hay, pasture, and trees. Potential for most urban uses is fair to good.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is cultivated. Minimum tillage and winter cover crops help to control erosion. In a few areas slopes are sufficiently long and smooth for terracing and contouring. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is suited to urban development if proper design and installation procedures are used. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is generally at a depth of more than 5 feet. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of the lack of sufficient stability in the subsoil. Problems can be avoided by strengthening or replacing the base material. This soil is well suited to dwellings with basements. Frost heave is a concern when constructing streets and roads but can be minimized by replacing the subgrade material. This soil is well suited to installation of septic tank absorption fields.

the profile, and the subsoil is thicker. In places the underlying material contains stratified sandy loam and silt loam outwash.

Included with this soil in mapping are small areas of somewhat poorly drained Kane soils and poorly drained Selma and Will soils. They occupy shallow depressions and drainageways and make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate in the upper layers and at a very rapid rate in the underlying material. Runoff from cultivated areas is slow. Available water capacity is moderate. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil ranges from neutral to slightly acid. Natural fertility is high, and organic-matter content is high. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed, although some areas in the eastern part of the county are used for urban development. The potential for crops and most urban uses is good.

This soil is well suited to corn, soybeans, wheat, and oats. It is also well suited to grasses and legumes grown for hay and pasture. Providing an adequate amount of water is the main concern when this soil is cultivated. Returning crop residue to the soil and adding animal manure help to maintain good tilth and organic-matter content and improve fertility.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet.

This soil is well suited to dwellings with and without basements. It is only moderately suited to streets and roads because of the shrink-swell potential, but problems can be avoided by replacing the subgrade material. It is well suited to septic tank absorption fields. A potential

places the surface layer is thinner and lighter in color. In places the subsoil is thinner and the underlying calcareous sand and gravel are closer to the surface.

Included with this soil in mapping are small areas of somewhat poorly drained Kane soils and poorly drained Will soils in shallow depressions and drainageways. These included soils make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate in the surface layer and subsoil and at a very rapid rate in the underlying material. Runoff from cultivated areas is medium. Available water capacity is moderate. Reaction in the surface layer varies with local liming practices, but it is commonly neutral. The subsoil is neutral or slightly acid. Natural fertility and organic-matter content are high. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed, although some areas are used for urban development. The potential for crops and most urban uses is good.

This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is cultivated. Some areas may be droughty in dry years. Conservation tillage and winter cover crops help to control erosion. In a few areas slopes are long enough and smooth enough for terracing and contouring. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a very rapid rate.

This soil is well suited to dwellings with and without basements. It is only moderately suited to streets and roads because of the shrink-swell potential, but problems can be avoided by replacing the subgrade material. This soil is well suited to septic-tank absorption fields. Potential for pollution of ground water exists because of the rapidly permeable underlying material. The soil is unsuited to sewage lagoons because of the seepage hazard in the underlying material.

This soil is well suited to most recreation uses. Good drainage and loam texture provide the firm surface required for heavy foot traffic. No limitations restrict the use of this soil for campsites, picnic areas, trails, footpaths, and bridle paths. Some leveling may be required before an area can be made suitable for playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIe.

298—Beecher silt loam. This nearly level to very gently sloping, somewhat poorly drained soil is on flats and drainageways on end moraines. Areas are irregular in shape and range from 10 to 200 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 silt loam about 4 inches thick. The subsoil is about 24 inches thick. The upper part is mottled, dark grayish brown silty clay loam; the middle part is mottled, olive brown silty clay and light olive brown silty clay loam; and the lower part is light olive brown silty clay loam. The underlying material, to a depth of 60 inches, is calcareous, mottled, light yellowish brown silty clay loam till. In places the surface layer is thicker and darker. In some areas stratified loamy outwash is in the underlying material.

Included with this soil in mapping are small areas of well drained and moderately well drained Morley and Markham soils on slight rises and poorly drained Milford soils in shallow depressions and drainageways. These soils make up 5 to 15 percent of the unit.

Water and air move through this soil at a slow rate, and runoff from cultivated areas is slow to medium. The available water capacity is high. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is slightly acid to mildly alkaline. Natural fertility is high, and organic-matter content is moderate. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed, although some areas in the eastern part of the county are used for urban development. The potential for crops is good, and the potential for most urban uses is fair to poor.

This soil is suited to corn, soybeans, oats, and wheat. It is also suited to grasses and legumes grown for hay and pasture. In places wetness is a problem when the soil is cultivated. Where wetness is a limitation, shallow surface ditches can be installed to improve drainage. Tile drains function poorly because of the slow water movement. Adding animal manure and returning crop residue to the soil help to maintain organic-matter content and fertility and improve soil tilth.

This soil can be made suitable for some urban uses. It is seasonally saturated at a depth of 1 to 3 feet. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. Water moves downward through this soil at a slow rate.

This soil is only moderately suited to dwellings without basements because of wetness and the lack of sufficient stability and strength in the subsoil. The water table can be lowered by installing tile drains, and strength and stability can be improved by replacing the base material. Use of this soil for dwellings with basements is limited by wetness. It is more difficult to lower the water table to a desired depth for construction of dwellings with basements. Frost heave is a concern when constructing streets and roads, but problems can be avoided by replacing the subgrade material. Use of this soil for septic tank absorption fields is limited by wetness and the slow permeability in the subsoil and underlying material. Adding fill material, increasing the size of the absorption field, and constructing subsurface drainage systems with

large backfilled trenches will improve suitability for septic tanks. Where possible, sanitary facilities should be connected to commercial sewers and treatment plants. This soil is well suited to sewage lagoons.

This soil is only moderately suited to most recreation uses. Wetness is the main concern but can be minimized

This soil is well suited to recreation uses. The nearly level surface, good drainage, and loam texture provide the firm surface required for intensive foot traffic. No limitations restrict the use of this soil for playgrounds, campsites, picnic areas, trails, footpaths, and bridle paths. Proper placement of trees, shrubs, and other vegetation

This soil is well suited to most recreation uses. Good drainage and loam soil texture provide the firm surface required for heavy foot traffic. No limitations restrict the use of this soil for campsites, picnic areas, trails, footpaths, and bridle paths. Some leveling may be required for playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIIs.

318C2—Lorenzo clay loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on convex ridgetops, side slopes, and knolls. Areas are oblong and range from 3 to 35 acres in size.

Typically, the surface layer is dark brown clay loam about 6 inches thick. The subsoil is about 10 inches thick. It is dark brown gravelly clay loam. The underlying material, to a depth of 60 inches, is calcareous yellowish brown and dark brown gravelly sand. In places the subsoil is thicker and it is deeper to sand and gravel. In other places the surface layer is thinner and lighter in color and sand and gravel are exposed at the surface.

Included with this soil in mapping are small areas of somewhat poorly drained Kane soils and poorly drained Will soils in shallow drainageways. These included soils make up less than 10 percent of the unit.

Water and air move through this soil at a moderately rapid rate in the surface layer and subsoil and at a rapid rate in the underlying material. Runoff from cultivated areas is medium. Available water capacity is low. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is neutral. Natural fertility is medium, and organic-matter content is moderate. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed, although some areas are used for urban development. The potential for crops is fair, and the potential for most urban uses is good.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. It is droughty in dry years. Erosion control and maintaining soil moisture are the main concerns if the soil is cultivated. Minimum tillage, contouring, and grassed waterways reduce soil loss. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss. Irregular topography, short, uneven slopes, and gravel near the surface limit terracing.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at

This soil is suited to most recreation uses. There are few limitations for camp areas, picnic areas, trails, footpaths, and bridle paths in these areas. Leveling is needed for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to control wind and water erosion. Capability subclass IVe.

323D—Casco loam, 10 to 15 percent slopes. This strongly sloping, well drained soil is on upland ridgetops, side slopes, and knolls. Areas are round or irregular in shape and range from 5 to 40 acres in size.

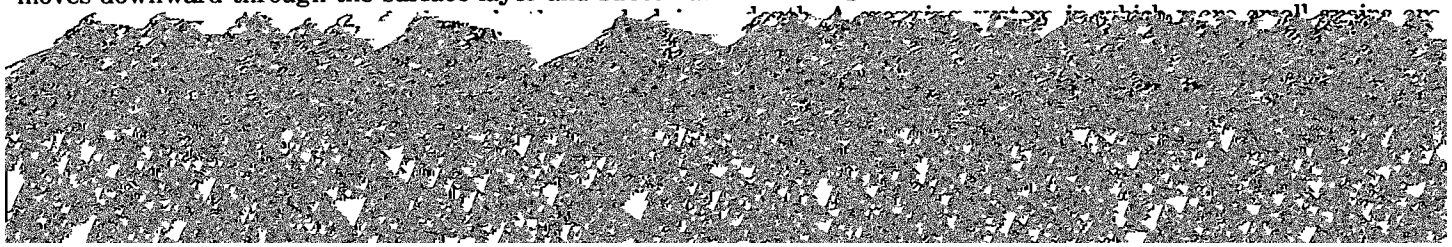
Typically, the surface layer is brown to dark brown loam about 8 inches thick. The subsoil is about 13 inches thick. The upper part is brown to dark brown clay loam, and the lower part is brown to dark brown sandy clay loam. The underlying material, to a depth of 60 inches, is brown gravelly sand. In places the surface layer is darker or has been mixed with the subsoil during tillage and contains more sand and gravel. In some areas gravelly sand is closer to the surface and the subsoil is thinner. The underlying material in some areas is calcareous loam till.

Included with this soil in mapping are small areas of poorly drained Will soils. They occupy shallow depressions and drainageways and make up 5 to 10 percent of the unit.

Water and air move through the surface layer and subsoil at a moderate rate and through the underlying material at a very rapid rate. Runoff from cultivated areas is rapid. Available water capacity is low. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is neutral or slightly acid. Natural fertility is low, and organic-matter content is low. The surface layer is friable, but in places it is difficult to till because of cobbles at or near the surface. It has a tendency to crust or become puddled after hard rains.

Most areas of this soil are in pasture and woodland, although some areas are used for urban development. The potential for crops is fair or poor, and the potential for most urban uses is fair.

This soil is suited to grasses and legumes grown for hay and pasture. It is suited to crops if proper management practices are used to control erosion. Corn and soybeans, for example, can be grown in a cropping system that effectively controls erosion. Yields are likely to be low, however, because of low fertility and low available water for plant growth. The hazard of erosion is severe. Careful management is needed to control erosion and maintain fertility and good tilth. Contouring, grassed waterways, and conservation tillage reduce soil erosion. Terracing is not recommended because of shallow soil

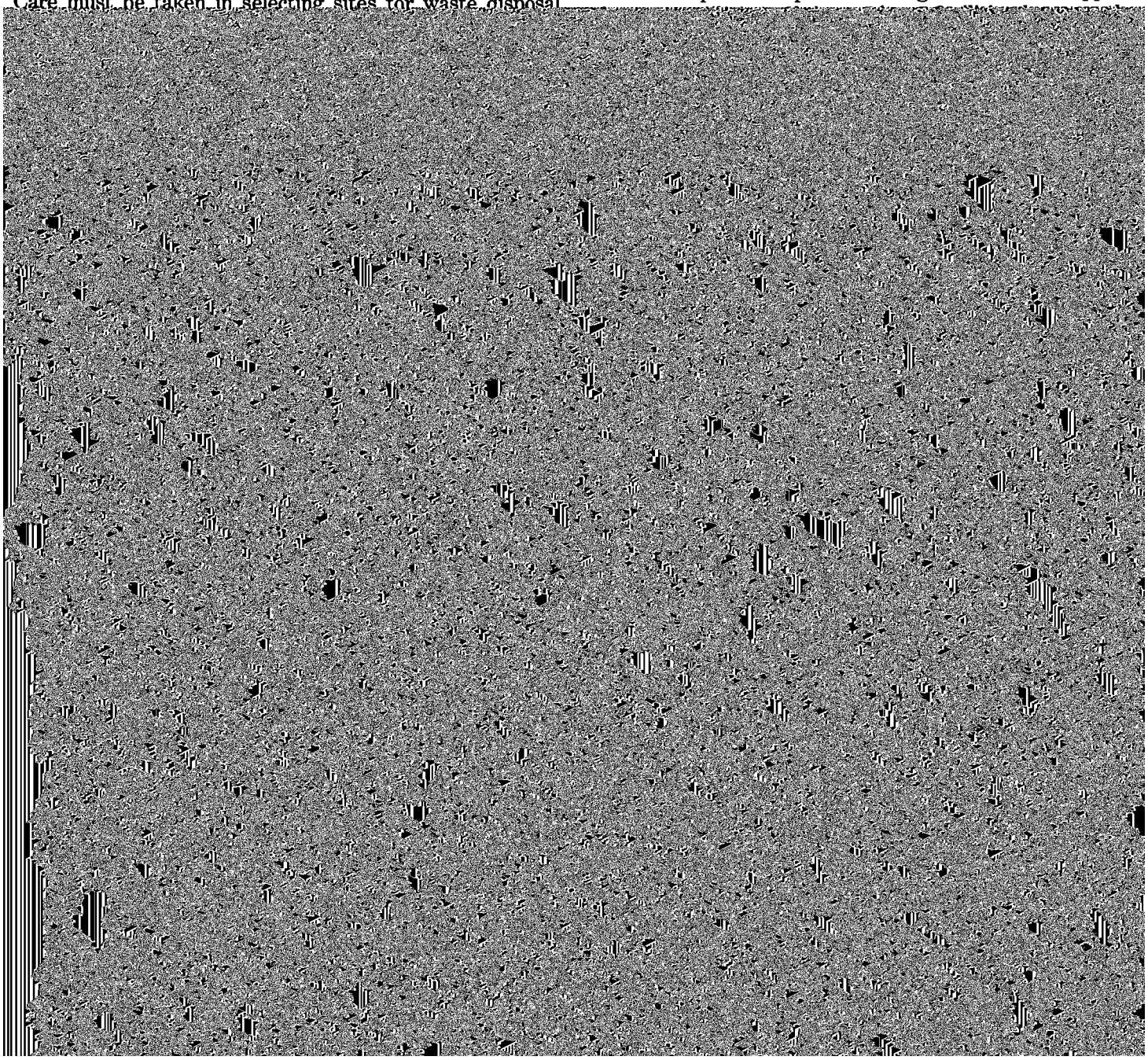


This soil is only moderately suited to dwellings with and without basements because of excessive slope. Slope and shrink-swell potential are concerns when constructing streets and roads. Problems can be avoided by using the underlying material for the subgrade and by grading the slopes. The soil is only moderately suited to septic tank absorption fields because of excessive slope. Special design of the absorption field is needed to compensate for the excessive slopes. Also, there is potential pollution of ground water because of the rapidly permeable underlying material. The soil is unsuited to sewage lagoons because of the seepage hazard in the underlying material. Care must be taken in selecting sites for waste disposal

This soil is unsuited to most urban uses because of excessive slope. The water table is generally at a depth of more than 6 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a very rapid rate.

Alternative sites should be selected for urban development when possible, and trees, shrubs, and other ornamentals and grasses need to be planted to help in the control of erosion. This moderately steep soil, in areas adjacent to developments, is well suited to winter sports. Also, with proper cover, it attracts a variety of songbirds and other wildlife.

There is potential pollution of ground water supplies

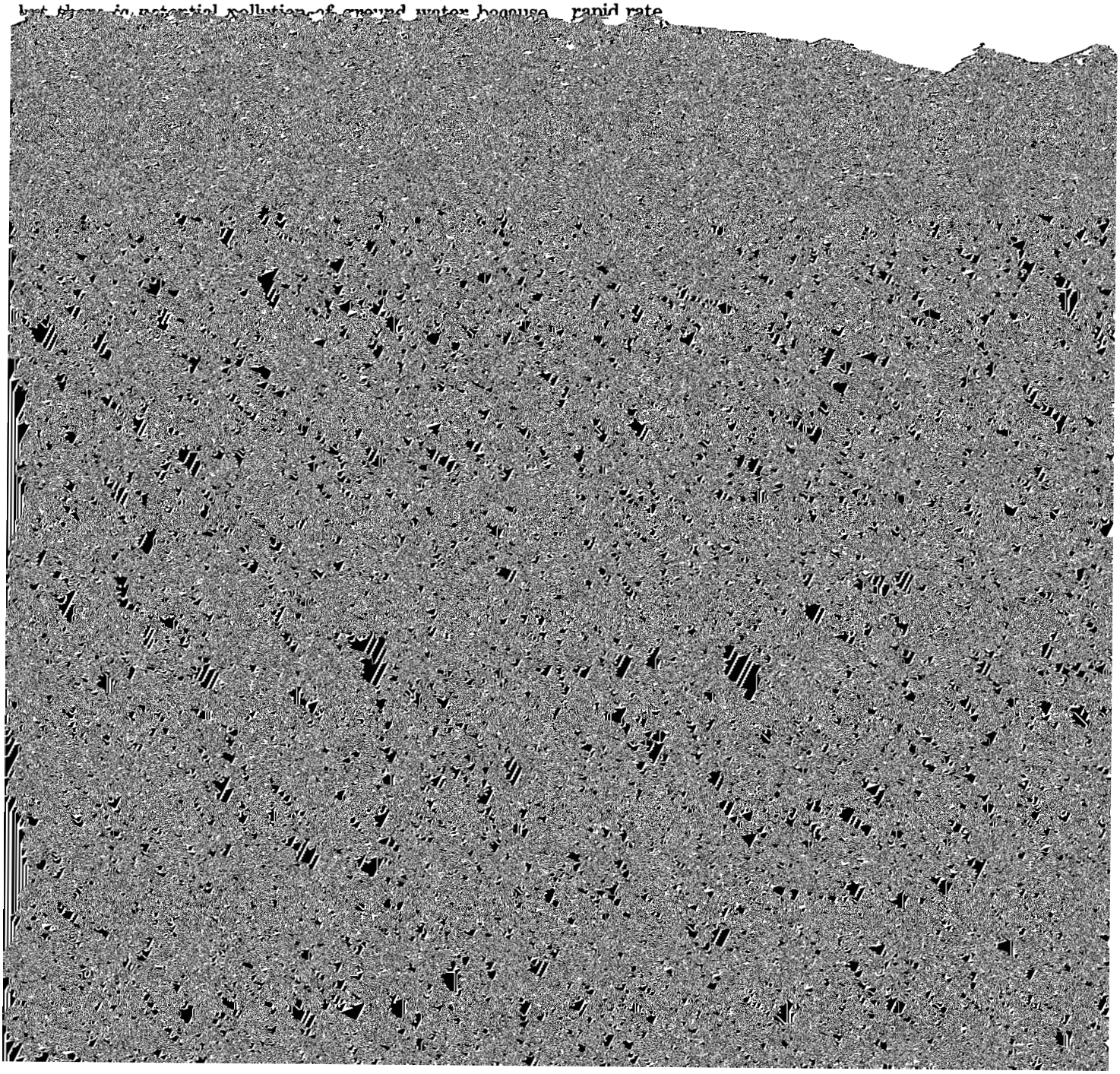


This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.

This soil is well suited to dwellings with and without basements. It is only moderately suited to streets and roads because of shrink-swell potential, but problems can be avoided by using the underlying material for subgrade. This soil is well suited to septic-tank absorption fields, but there is potential pollution of ground water because

tivated. Conservation tillage and winter cover crops help to control erosion. A few slopes are long enough and smooth enough for terracing and contouring. Returning crop residue to the soil and adding animal manure help to maintain content of organic matter, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.



Most areas of this soil are farmed, although some areas in the eastern part of the county are used for urban development. The potential for crops and for most urban uses is good.

This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is cultivated. Minimum tillage, terracing, contouring, and grassed waterways reduce soil loss. Returning crop residue to the soil and adding animal manure help maintain content of organic matter, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.

This soil is well suited to dwellings with and without basements. It is only moderately suited to streets and roads because of the shrink-swell potential, but problems can be avoided by using the underlying material for subgrade construction. This soil is well suited to septic-tank absorption fields, but there is potential pollution of ground water because of the rapidly permeable underlying material. It is unsuited to sewage lagoons because of seepage in the underlying material.

This soil is suited to most recreation uses. Good drainage and silt loam soil texture provide the firm surface required for heavy foot traffic. Few limitations exist for campsites, picnic areas, trails, footpaths, and bridle paths. Leveling is needed prior to the construction of playgrounds. Proper placement of trees, shrubs, and other vegetation helps to control wind and water erosion. Capability subclass IIIe.

327A—Fox silt loam, 0 to 2 percent slopes. This nearly level, well drained soil is on ridgetops and broad plains on uplands. Areas are irregular in shape and range from 10 to 150 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil is about 25 inches thick. The upper part is dark yellowish brown silty clay loam, and the lower part is strong brown clay loam. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown gravelly sand. In places the surface is thicker and darker. In some areas the underlying gravelly sand is deeper in the profile and the subsoil is thicker.

Included with this soil in mapping are small areas of somewhat poorly drained Kane and Millbrook soils and poorly drained Will and Drummer soils in shallow depressions and drainageways. These included soils make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate in the surface layer and subsoil and at a rapid rate in the underlying material. Runoff from cultivated areas is slow to medium. Available water capacity is moderate. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is slightly acid. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range of moisture content. In places the surface tends to crust or puddle, however, after hard rains, especially where the plow layer contains subsoil material.

Most areas of this soil are farmed, although some areas in the eastern part of the county are used for urban development. The potential for crops and most urban uses is good.

This soil is well suited to corn, soybeans, wheat, and oats. It is also well suited to grasses and legumes grown for hay and pasture. Providing adequate soil moisture in dry years is the main concern when this soil is cultivated. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.

This soil is well suited to dwellings with and without basements. It is only moderately suited to streets and roads because of the shrink-swell potential, but problems can be avoided by using the underlying material for subgrade construction. This soil is well suited to septic-tank absorption fields, but there is potential pollution of ground water because of the rapidly permeable underlying material. It is unsuited to sewage lagoons because of seepage in the underlying material.

This soil is well suited to recreation uses. The nearly level surface, good drainage, and silt loam texture provide the firm surface required for intensive foot traffic. No limitations restrict the use of this soil for playgrounds, campsites, picnic areas, trails, footpaths, and bridle paths. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIs.

327B—Fox silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridgetops and knolls on uplands. Areas are irregular in shape and range from 4 to 75 acres in size.

Typically, the surface layer is dark gray silt loam about 6 inches thick. The subsurface layer is brown to dark brown silt loam about 4 inches thick. The subsoil is about 20 inches thick. The upper part is dark yellowish brown silty clay loam, and the lower part is brown to dark brown clay loam. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown gravelly sand. In places the surface layer is thicker and darker. In some areas the underlying gravelly sand is closer to the surface and the subsoil is thinner. In places the underlying sand and gravel are deeper.

Included with this soil in mapping are small areas of somewhat poorly drained Kane and Millbrook soils and poorly drained Will and Drummer soils in shallow depres-

sions and drainageways. These included soils make up 5 to 10 percent of the unit.

Water and air move through this soil at a moderate rate in the surface layer and subsoil and at a rapid rate in the underlying material. Runoff from cultivated areas is medium. Available water capacity is moderate. Reaction in the surface layer varies according to local liming practices but is commonly neutral. The subsoil is neutral to slightly acid. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range in moisture content. In places the surface has a tendency to crust or puddle after hard rains, however, especially where the plow layer contains subsoil material.

Most areas of this soil are farmed. The potential for crops and most urban uses is good.

This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and pasture. Erosion and droughtiness are the main hazards if the soil is cultivated. Conservation tillage and winter cover crops help to control erosion. A few slopes are long enough and smooth enough for terracing and contouring. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.

This soil is well suited to dwellings with and without basements. It is only moderately suited to streets and roads because of the shrink-swell potential, but problems can be avoided by using the underlying material as subgrade. This soil is well suited to septic-tank absorption fields, but there is potential pollution of ground water because of the rapidly permeable underlying material. It is unsuited to sewage lagoons because of seepage in the underlying material.

This soil is well suited to most recreation uses. Good drainage and silt loam texture provide the firm surface required for heavy foot traffic. No limitations restrict the

part is brown to dark brown sandy loam. The underlying material, to a depth of 60 inches, is calcareous, brown gravelly sand. In places the surface layer is thicker and darker. In some areas the subsoil is thicker and the underlying calcareous sand and gravel are deeper, and in other places the subsoil is thinner than typical and the underlying gravelly sand is closer to the surface.

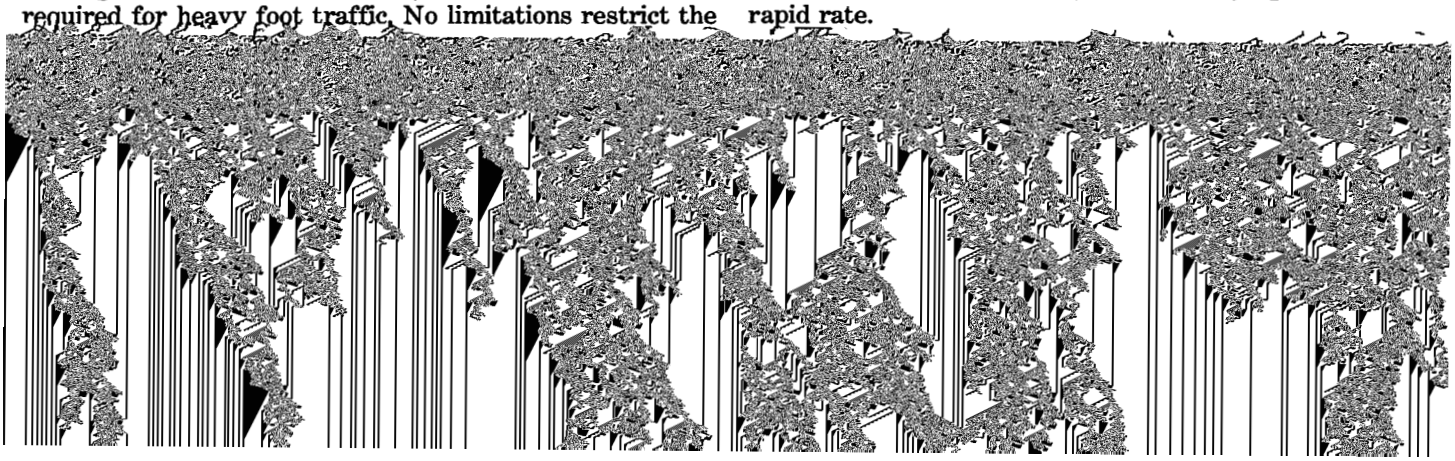
Included with this soil in mapping are small areas of somewhat poorly drained Kane soils and poorly drained Will soils in shallow drainageways. These included soils make up less than 10 percent of the unit.

Water and air move through this soil at a moderate rate in the surface layer and subsoil and at a rapid rate in the underlying material. Runoff from cultivated areas is medium. Available water capacity is moderate. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is slightly acid or mildly alkaline. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range of moisture content. In places, however, the surface has a tendency to crust or puddle after hard rains, especially where the plow layer contains subsoil material.

Most areas of this soil are farmed, although some areas in the eastern part of the county are used for urban development. The potential for crops and most urban uses is good.

This soil is suited to corn, soybeans, wheat, and oats. It is also suited to growing grasses and legumes for hay and pasture. Erosion and droughtiness are the main hazards if the soil is cultivated. The surface crusts easily. Minimum tillage, terracing, contouring, and grassed waterways reduce soil loss. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss. In some areas the soil is unsuited to terracing because of irregular topography and short slopes.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.



it for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to control wind and water erosion. Capability subclass IIIe.

327D—Fox silt loam, 10 to 15 percent slopes. This strongly sloping, well drained soil is on kamic ridges and side slopes. Areas are oblong and range from 5 to 25 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 4 inches thick. The subsurface layer is brown silt loam about 4 inches thick. The subsoil is about 18 inches thick. The upper part is brown to dark brown silty clay loam, and the lower part is strong brown clay loam. The underlying material, to a depth of 60 inches, is calcareous, brown to dark brown gravelly sand. In places the surface layer and subsoil are thinner, and calcareous sand and gravel are closer to the surface. In some areas calcareous loam till is in the underlying material.

Included with this soil in mapping are small areas of somewhat poorly drained Kane soils and poorly drained Will soils in shallow drainageways. These included soils make up less than 5 percent of the unit.

Water and air move through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate. Runoff from cultivated areas is rapid. Available water capacity is moderate. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil ranges from slightly acid to neutral. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range in moisture content. In places, however, the surface has a tendency to crust or puddle after hard rains, especially where the plow layer contains subsoil material.

Most areas of this soil are farmed, although some areas in the eastern part of the county are used for urban development. The potential is fair for crops and most urban uses.

This soil is suited to grasses and legumes grown for hay and pasture. Some areas are droughty in dry years. Under proper management that controls erosion, corn and soybeans can be rotated in the cropping system. The erosion hazard is severe. Careful management is needed to control erosion and maintain fertility and good tilth. Terracing, contouring, grassed waterways, and conservation tillage reduce soil loss. A cropping system in which more small grains are grown than corn and soybeans functions best. Some areas are unsuited to terracing because of the irregular topography and the short, uneven slopes.

This soil is suitable for urban development if proper design and installation procedures are used. The water table is at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.

This soil is only moderately suited to dwellings with and without basements because of the somewhat excessive slope, but grading improves slope restrictions. Slope and shrink-swell potential are concerns when constructing streets and roads, but problems can be avoided by replacing subgrade material and grading slopes. This soil is only moderately suited to installation of septic-tank absorption fields because slope may restrict the size of the field. There is also potential pollution of ground water because of the rapidly permeable underlying material. This soil is not suited to sewage lagoons because of seepage in the underlying material.

This soil is suited to some recreation uses. Few limitations restrict the use of this soil for footpaths, trails, and bridle paths. Campsites and picnic areas require some leveling prior to construction, and playgounds require extensive leveling. Proper placement of trees, shrubs, and other vegetation is important for controlling erosion. Capability subclass IVe.

329—Will silty clay loam. This level to nearly level, poorly drained soil is in drainageways. Areas are irregular in shape and range from 10 to 500 acres in size.

Typically, the surface layer is black silty clay loam about 11 inches thick. The subsoil is about 20 inches thick. The upper part is mottled, very dark gray clay loam; the middle part is mottled, olive gray clay loam; and the lower part is dark gray and grayish brown sandy loam. The underlying material, to a depth of 60 inches, is grayish brown, calcareous gravelly sand. In some areas stratified loamy outwash is in the lower part of the subsoil and in the underlying material. In some areas free carbonates are at or near the surface.

Included with this soil in mapping are small areas of somewhat poorly drained Kane soils and well drained Warsaw soils on slight rises, ridges, and knolls. These included soils make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate in the surface layer and subsoil and at a rapid rate in the underlying material. Runoff from cultivated areas is slow to ponded. Available water capacity is moderate. Reaction in the surface layer is commonly neutral. The subsoil is neutral or mildly alkaline. Natural fertility is high, and organic-matter content is high. The surface layer is friable, but it becomes compact and cloddy if tilled when too wet.

Most areas of this soil are farmed. The potential for crops is good, and the potential for most urban uses is poor.

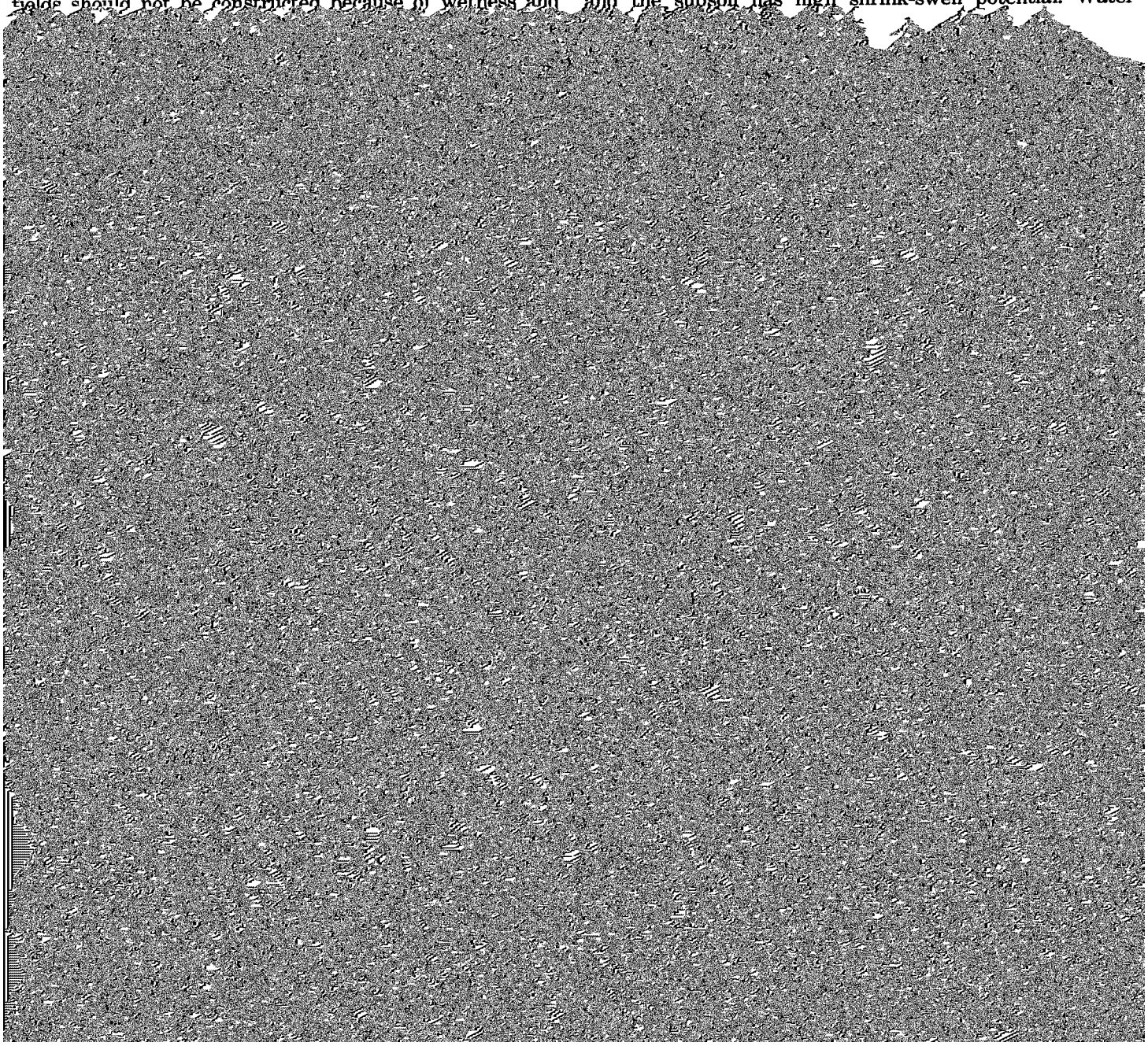
This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and pasture. Wetness is the main concern when the soil is cultivated. Tile drains and surface ditches improve drainage. Where tile drains are installed, special filters are needed to prevent clogging by sand and gravel. If the soil is plowed in fall and left bare, wind erosion may occur during spring. Winter cover crops and conservation tillage reduce erosion. Returning crop residue to the soil and adding animal manure help to maintain good tilth, maintain or increase organic-matter content, and improve fertility.

This soil is poorly suited to most urban uses. It is seasonally saturated at a depth of less than 1 foot. This soil is subject to occasional flooding. It lacks sufficient

stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. Water moves downward through this soil at a moderate rate.

Areas of this soil that are used for development must be artificially drained and protected from flooding. Dwellings with basements may be difficult or expensive to construct because of the problem of lowering the water table. Dwellings without basements should be constructed only after drainage systems are installed. Use of this soil for streets and roads is limited by wetness, flooding, and frost heave potential. Installing drainage systems and using fill material makes this soil more suitable for streets and roads. Conventional septic-tank absorption fields should not be constructed because of wetness and pasture. Wetness is the main concern when the soil is cultivated. Tile drains and surface ditches improve drainage, and they are generally required for cultivated crops. If the soil is plowed in fall and left bare, wind erosion may occur during spring and winter. Winter cover crops or conservation tillage reduces erosion. Returning crop residue to the soil and adding animal manure help to maintain good tilth and organic-matter content and improve fertility.

This soil is poorly suited to most urban uses. It is frequently saturated less than 1 foot below the surface. Also, this soil is subject to frequent flooding. It lacks sufficient stability because it has high frost heave potential and the subsoil has high shrink-swell potential. Water



moderate. Reaction in the surface layer varies with local liming practices but is commonly neutral. Natural fertility and organic-matter content are high. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed. The potential for crops is good, and the potential for urban uses is fair to poor.

This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and pasture. In places wetness is a concern when the soil is cultivated. Where wetness is a limitation, tile drains and shallow surface ditches will improve drainage. Where tile drains are used, a special filter placed around the tile drain will prevent it from being clogged by sand and gravel. Returning crop residue to the soil and adding animal manure help to maintain tilth and organic-matter content and improve fertility.

This soil can be made suitable for many urban uses if proper design and installation procedures are used. It is seasonally saturated 1 to 3 feet below the surface. It lacks sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a rapid rate.

This soil is only moderately suited to dwellings without

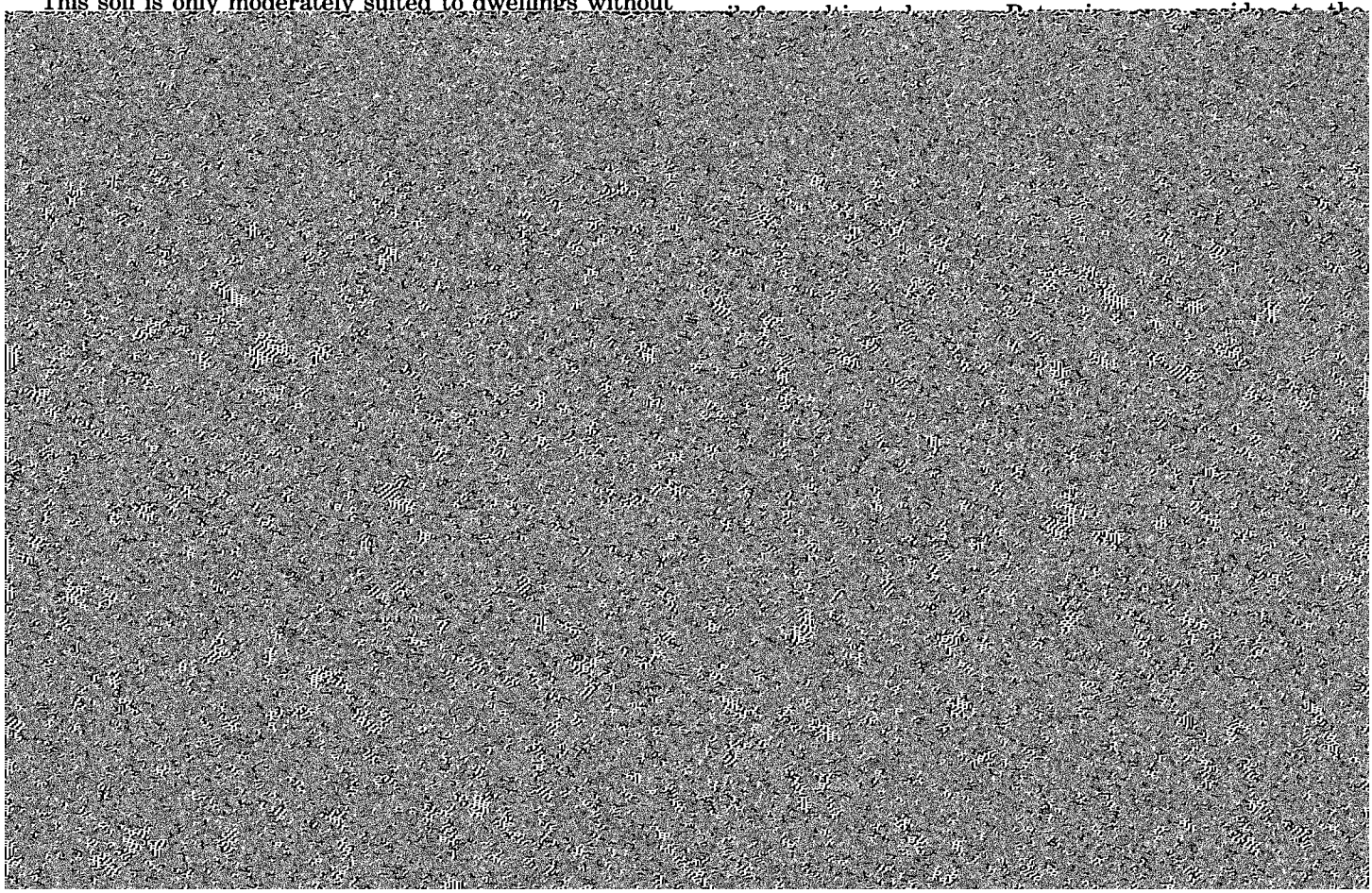
loam, and the lower part is dark yellowish brown sandy loam. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown, stratified fine sandy loam and silt loam. In places the surface layer is thinner and lighter in color or it is thicker and darker. Also, in some places the subsoil is thicker and stratified outwash is deeper. The underlying material contains sand and gravel in places.

Included with this soil in mapping are small areas of somewhat poorly drained Millbrook and Brenton soils and poorly drained Drummer soils. These included soils are in shallow depressions and drainageways. They make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate, and runoff from cultivated areas is slow. The available water capacity is moderate. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is medium acid to neutral. Natural fertility is high, and organic-matter content is moderate. The surface layer is friable and easily tilled over a relatively wide range of moisture content.

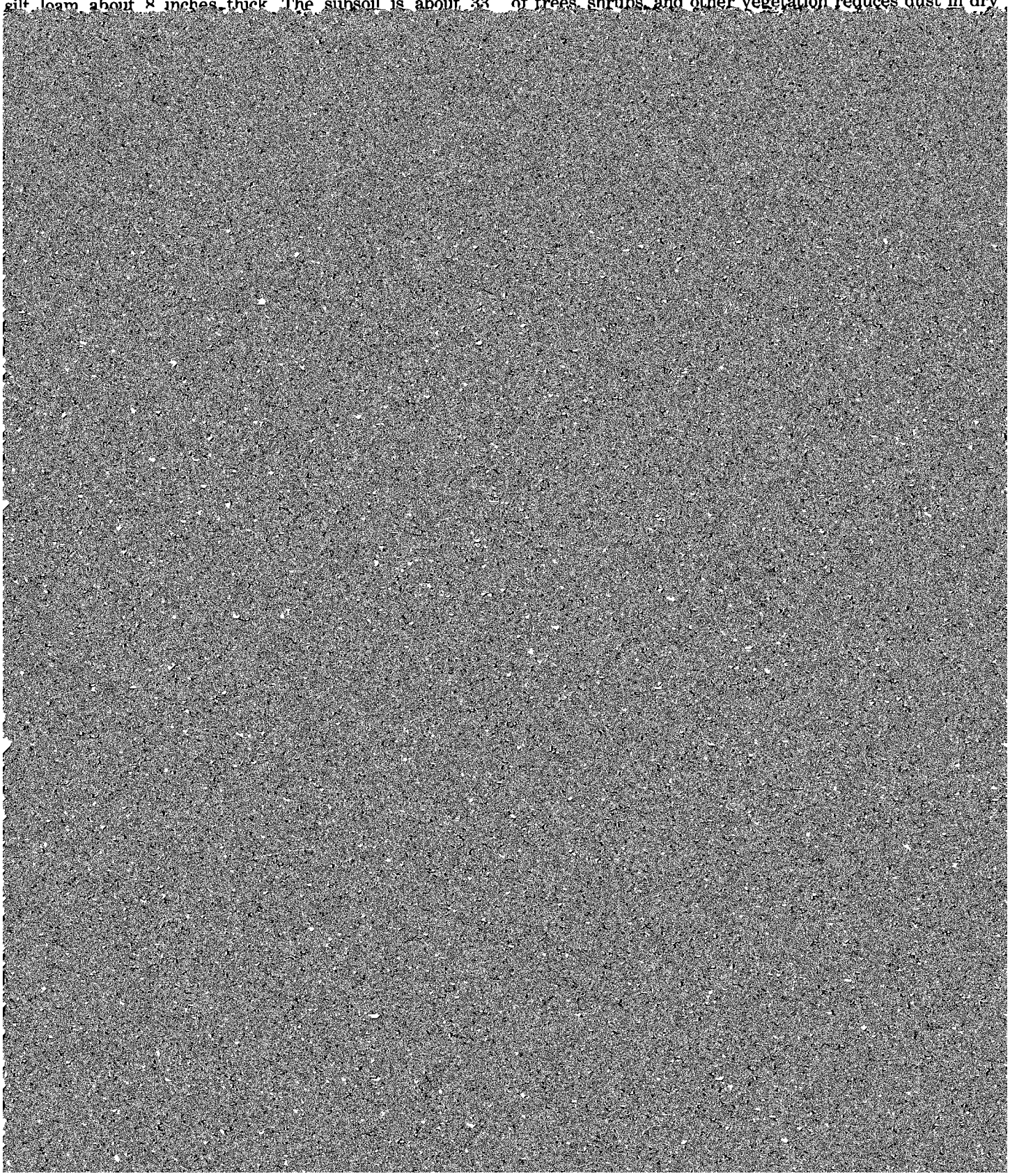
Most areas of this soil are farmed. The potential for crops and most urban uses is good.

This soil is well suited to corn, soybeans, wheat, and oats. It is also well suited to grasses and legumes grown for hay and pasture. No limitations restrict the use of this



Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is about 33

make the area suitable for playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry



This soil is suited to most recreation uses. Good drainage and silt loam texture provide the firm surface required for heavy foot traffic. Few limitations restrict the use of this soil for campsites, picnic areas, trails, footpaths, and bridle paths. Leveling is needed for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to control wind and water erosion. Capability subclass IIIe.

347—Canisteo loam. This level or nearly level, poorly drained soil is on drainageways and in depressions on out-

using fill material makes this soil more suitable for streets and roads. Conventional septic-tank absorption fields should not be constructed because of wetness and flooding. All sanitary facilities should be connected to commercial sewers and treatment plants. Use of this soil for sewage lagoons is limited by wetness, flooding, and seepage. Protection from flooding and treatment to seal the bottom of the lagoon makes it more suitable. Onsite investigations are needed to properly evaluate and plan the development of specific sites.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a moderately rapid rate.

This soil is well suited to dwellings with basements. It is only moderately suited to dwellings without basements and to streets and roads because of shrink-swell potential. Problems can be avoided by replacing or strengthening the subgrade material. This soil is well suited to septic tank absorption fields. It is unsuited to sewage lagoons because of seepage in the underlying material.

This soil is well suited to most recreation uses. Good drainage and silt loam soil texture provide the firm surface required for heavy foot traffic. No limitations restrict the use of this soil for campsites, picnic areas, trails, footpaths, and bridle paths. Some leveling may be required for playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIe.

361C—Kidder silt loam, 5 to 10 percent slopes. This moderately sloping, well drained soil is on convex ridgetops, knolls, and short, uneven side slopes on end moraines. Areas are irregular in shape and range from 5 to 70 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is about 28 inches thick. The upper part is dark yellowish brown silty clay loam, the middle part is brown to dark brown clay loam, and the lower part is yellowish brown clay loam. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown sandy loam till. In places the underlying material is gravelly loam and in other places it is calcareous loam till; in other areas cultivation has caused much of the surface layer to become eroded.

Included with this soil in mapping are small areas of somewhat poorly drained Herbert soils and poorly drained Drummer soils. These included soils are in shallow depressions and drainageways. They make up 5 to 10 percent of the map unit.

Water and air move at a moderate rate through the surface layer and subsoil and at a moderately rapid rate through the underlying material. Runoff from cultivated areas is rapid. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil is mildly alkaline to medium acid. Natural fertility and organic-matter content are low. Available water capacity is moderate. The surface layer is friable and easily tilled over a relatively wide range of moisture content. It has a tendency to crust or puddle, however, after hard rains.

Most areas of this soil are used for urban development, although some areas in the eastern part of the county are used for woodland or pasture. The potential for crops is fair, and the potential for most urban uses is good.

This soil is suited to corn, soybeans, wheat, and oats. It is also suited to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is cultivated. In some areas the soil tends to be droughty, especially in dry years. Minimum tillage, terracing, contouring, and grassed waterways reduce soil loss. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is generally at a depth of more than 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate and through the underlying material at a moderately rapid rate.

This soil is well suited to dwellings with basements. It is only moderately suited to dwellings without basements and to streets and roads because of shrink-swell potential. Problems can be avoided, however, by replacing or strengthening the subgrade material. This soil is well suited to septic-tank absorption fields. It is unsuited to sewage lagoons because of seepage in the underlying material.

This soil is suited to most recreation uses. Good drainage and silt loam texture provide the firm surface required for heavy foot traffic. Few limitations restrict the use of this soil for campsites, picnic areas, trails, footpaths, and bridle paths. Leveling is needed for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to control wind and water erosion. Capability subclass IIIe.

361D—Kidder silt loam, 10 to 15 percent slopes. This strongly sloping, well drained soil is on uneven side slopes and ridges on end moraines. Areas are oval and range from 5 to 40 acres in size.

Typically, the surface layer is dark brown silt loam about 4 inches thick. The subsurface layer is brown to dark brown loam about 4 inches thick. The subsoil is about 24 inches thick. The upper part is brown to dark brown sandy clay loam, the middle part is dark brown and strong brown sandy clay loam, and the lower part is brown to dark brown sandy loam. The underlying material, to a depth of 60 inches, is calcareous, yellowish brown sandy loam till. In places the underlying material is gravelly sand, and in other places it is calcareous loam till. In places the surface layer is loam and clay because it has been mixed with subsoil by tillage. In some areas slopes are stronger.

Included with this soil in mapping are small areas of somewhat poorly drained Herbert soils and poorly drained Drummer soils in shallow depressions and drainageways. These included soils make up less than 10 percent of the unit.

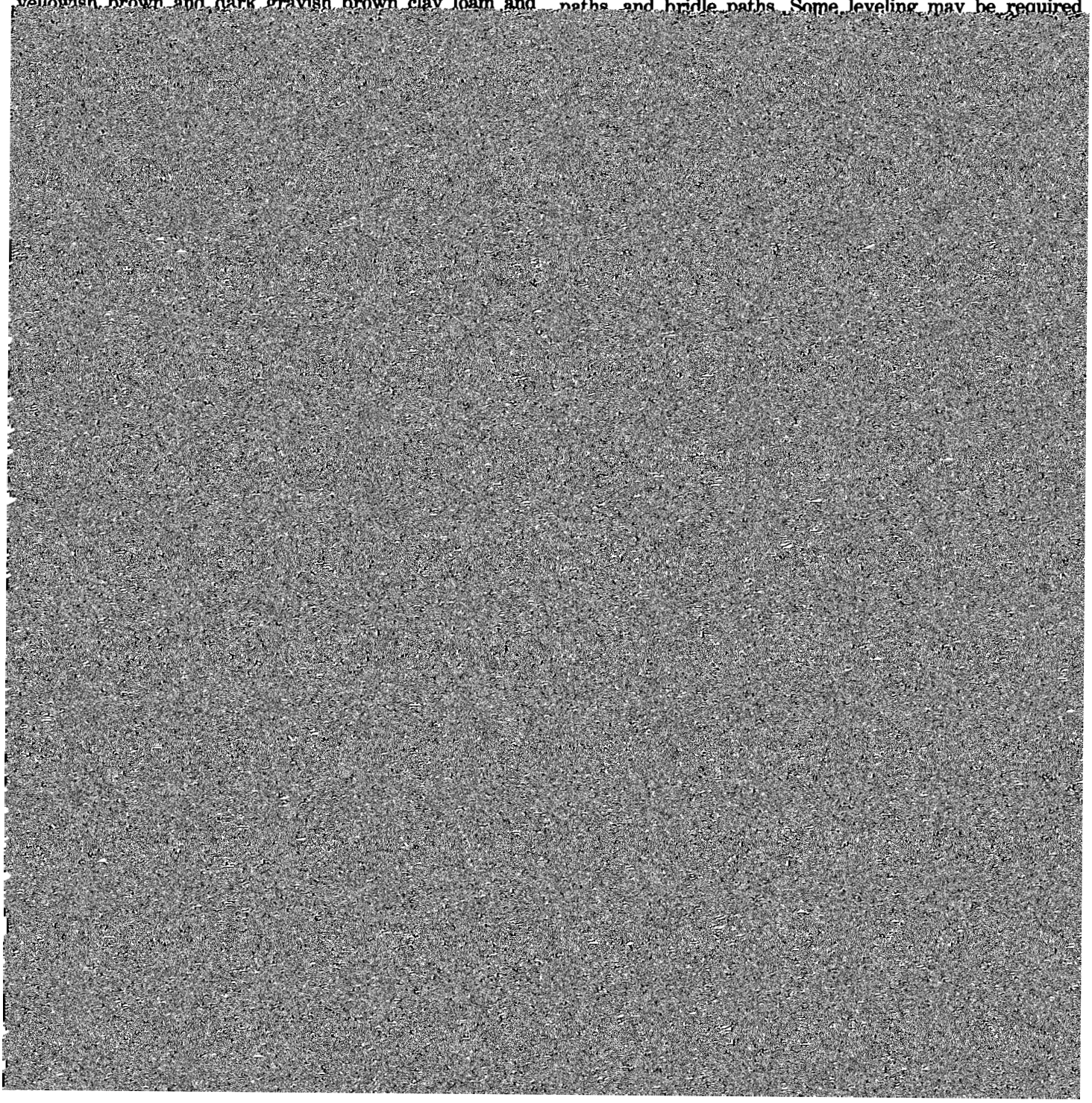
Water and air move at a moderate rate through the surface layer and subsoil and at a moderately rapid rate through the underlying material. Runoff from cultivated areas is rapid. Reaction in the surface layer varies with local liming practices but is commonly neutral. The subsoil

369B—Waupecan silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on broad ridgetops and side slopes on outwash plains. Areas are long and narrow and range from 10 to 120 acres in size.

Typically, the surface layer is very dark gray and very dark grayish brown silt loam about 11 inches thick. The subsoil is about 40 inches thick. The upper part is brown to dark brown silty clay loam, the middle part is dark yellowish brown silty clay loam, and the lower part is dark yellowish brown and dark grayish brown clay loam and

ment in the subsoil may be a problem, but it can be corrected by increasing the size of the absorption field. Care must be taken in selecting sites for waste disposal because of the rapid permeability of the underlying material, or ground water contamination may result.

This soil is well suited to most recreation uses. Good drainage and silt loam texture provide the firm surface required for heavy foot traffic. There are no restrictions to use of this soil for campsites, picnic areas, trails, footpaths, and bridle paths. Some leveling may be required



Areas are irregular in shape and range from 5 to 80 acres in size.

Typically, the surface layer is black and very dark gray silt loam about 12 inches thick. The subsoil is about 23 inches thick. The upper part is mottled, dark grayish brown silty clay loam; the middle part is mottled, brown to dark brown and grayish brown silty clay loam; and the

the soil for sewage lagoons is limited by wetness. Seepage is also a problem, but can be overcome by special treatment that seals the bottom of the lagoon.

This soil is only moderately suited to most recreation uses. Wetness is the main problem and can be overcome through the use of tile or shallow drainage ditches. The use of trees, shrubs, and other vegetation reduces dust

downward through the soil at a moderately slow to slow rate.

This soil is moderately suited to dwellings without basements because of instability in the subsoil, but this can be corrected by strengthening or replacing the base material. This soil is only moderately suited to dwellings with basements because it is seasonally wet. This can be corrected by installing subsurface drainage systems. Frost heave and shrink-swell are problems for streets and roads. Replacing subgrade material will reduce these problems. The moderately slow to slow rate of water movement in the subsoil and underlying material is a problem when septic tank absorption fields are installed. This can be improved by increasing the size of the absorption field and by adding more porous material. This soil is moderately suited to sewage lagoons because of slope. Some grading may be necessary.

This soil is suited to recreation uses. There are few

Most areas of this soil are farmed, although some areas in the eastern part of the county are used for urban development. The potential is good for crops and fair to poor for most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is cultivated. Minimum tillage, terracing, and contouring reduce soil loss. Returning crop residue to the soil and adding animal manure help maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss. Some slopes are not sufficiently long and smooth for terracing and contouring.

This soil is moderately suited to urban development if proper design and installation procedures are used. It does not have sufficient stability because it has high frost heave potential and the subsoil has moderate to high

some areas contain gravelly sand in the lower part of the subsoil and the underlying material.

Included with this soil in mapping are small areas of somewhat poorly drained Millbrook soils and poorly drained Selma soils. They occupy drainageways and make up 5 to 15 percent of the unit.

Water and air move through this soil at a moderate rate, and runoff is medium. Available water capacity is high. Reaction in the surface layer varies according to local liming practices, but it is commonly medium acid. The subsoil is neutral to strongly acid. Natural fertility is medium, and the organic-matter content is low. The surface layer is friable and easily tilled through a fairly wide range of moisture content.

Most areas of this soil are farmed. The potential is good for crops, hay, pasture, and trees and for most urban uses.

This soil is suited to corn, soybeans, and small grain and to grasses and legumes grown for hay and pasture. If the soil is cultivated, erosion is the main hazard. Conservation tillage and winter cover crops help prevent excessive soil loss. Returning crop residue or the regular addition of other organic material helps to maintain organic-matter content, improve fertility and soil tilth, increase water infiltration, and reduce soil loss. Some slopes are sufficiently long and smooth for terracing and contouring.

This soil is suitable for urban uses if proper design and installation procedures are used. The water table is usually below a depth of 5 feet. The soil does not have sufficient stability because it has moderate frost heave potential and the subsoil has moderate shrink-swell potential. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of a lack of strength and stability in the subsoil. This problem can be corrected by strengthening or replacing the base material. The soil is well suited to dwellings with basements and to septic tank absorption fields.

This soil is well suited to most recreation uses. Good drainage and loam texture provide the firm surface required for heavy foot traffic. There are no soil limitations for camp areas, picnic areas, trails, footpaths, and bridle paths. Some leveling may be required before the area is suited to playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIe.

570C—Martinsville loam, 5 to 10 percent slopes. This moderately sloping, well drained soil is on convex ridgetops and side slopes. Areas are irregular in shape and range from 10 to 80 acres in size.

Typically, the surface layer is dark grayish brown loam about 9 inches thick. The subsurface layer is brown loam about 5 inches thick. The subsoil is about 45 inches thick. The upper part is brown clay loam; the middle part is mottled, brown to dark brown sandy clay loam; and the lower part is mottled, light yellowish brown and brown sandy loam and silt loam. The underlying material, to a depth of 70 inches, is yellowish brown sandy loam. In some places there is less sand in the surface layer and subsoil. In other areas calcareous sand and gravel are in the underlying material. In some areas much of the surface layer has been eroded through tillage.

Included with this soil in mapping are small areas of somewhat poorly drained Millbrook soils and poorly drained Selma soils. They occupy shallow drainageways and make up less than 10 percent of the unit.

Water and air move through this soil at a moderate rate, and runoff from cultivated areas is medium. Available water capacity is high. Reaction in the surface layer varies with local liming practices, but is commonly neutral. The subsoil is medium acid to neutral. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range in moisture content. It may have a tendency to crust or puddle, however, after hard rains, especially where the plow layer contains subsoil material.

Most areas of this soil are farmed. The potential is good for crops and most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is cultivated. Poor tilth is also a limitation. Conservation tillage, terracing, contouring, and use of grassed waterways reduce soil loss. Returning crop residue and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. The water table is usually below a depth of 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate.

This soil is well suited to dwellings with and without basements. It is only moderately suited to streets and roads due to shrink-swell, but this problem can be corrected by replacing subgrade material. It is well suited to septic tank absorption systems. It is suited to sewage lagoons if specially treated to seal the bottom.

This soil is suited to most recreation uses. Good drainage and loam texture provide a firm surface, which is required for heavy foot traffic. There are few limitations for camp areas, picnic areas, trails, footpaths, and bridle paths. Leveling is needed for playgrounds. Proper placement of trees, shrubs, and other vegetation helps to control wind and water erosion. Capability subclass IIIe.

656B—Octagon silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on side slopes and convex ridgetops and end moraines. Areas are irregular in shape and range from 5 to 75 acres in size.

Typically, the surface layer is very dark brown silt loam about 7 inches thick. The subsoil is about 23 inches thick. The upper part is brown to dark brown silt loam, the middle part is brown to dark brown clay loam, and the lower part is brown clay loam. The underlying material, to a depth of 60 inches, is calcareous, brown loam till.

In some places, the surface layer is thicker and darker or

inches thick. The upper part is brown to dark brown clay

vegetation helps to control wind and water erosion. Capability subclass IIIe.

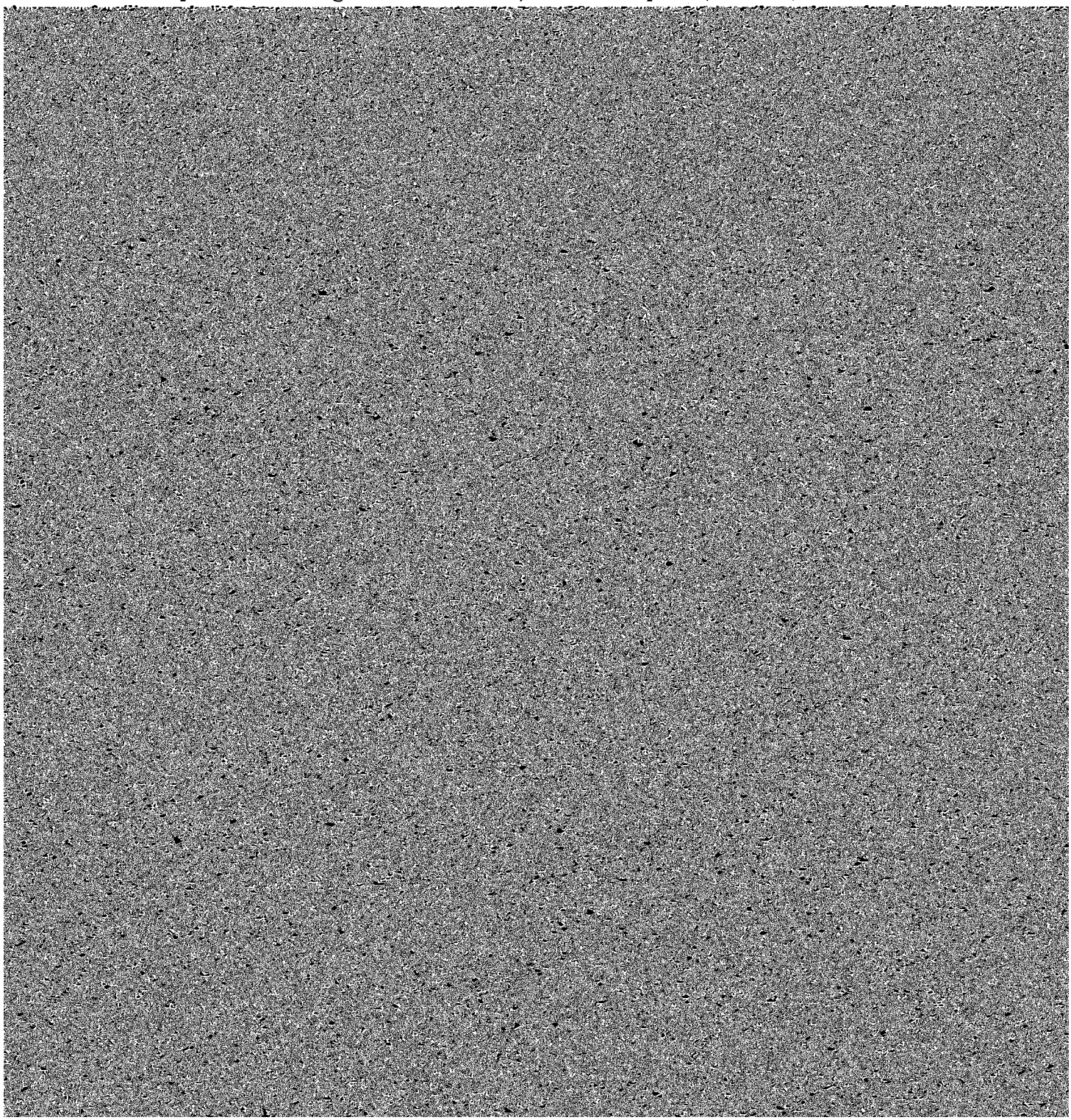
absorption systems, but slope may restrict the size of the absorption field. Grading may help correct slope restric-

This soil is only moderately suited to dwellings without basements because of instability in the subsoil, but this can be corrected by strengthening or replacing the base material. It is well suited to dwellings with basements. Frost heave is a problem for constructing streets and

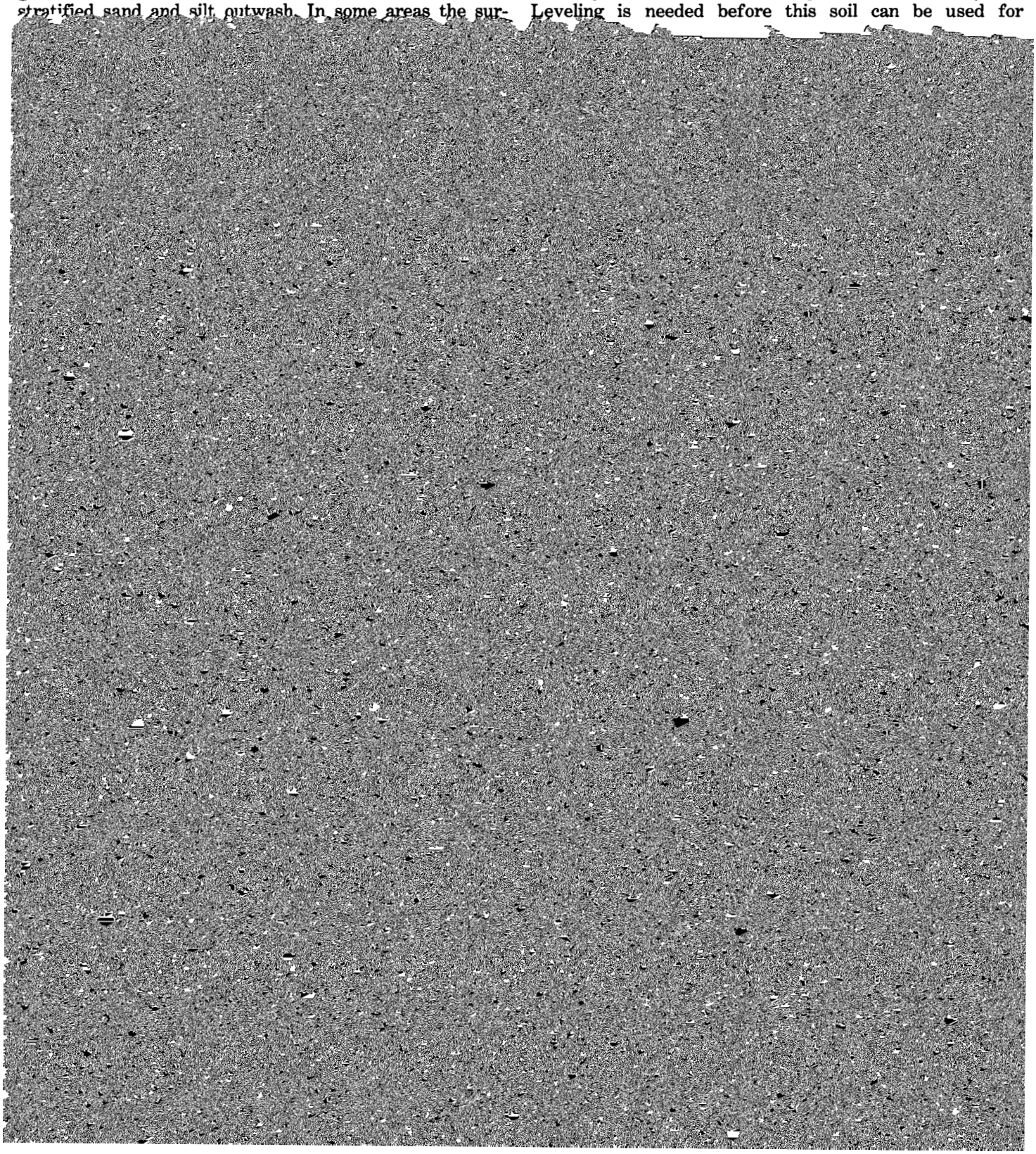
potential and the subsoil has moderate shrink-swell potential. Water moves downward through the soil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of wetness and the instability in the subsoil. The water table can be lowered by installing tile

This soil is well suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. There are no major soil limitations to growing cultivated crops. There is a tendency for a crust to form on the surface, but this problem can be reduced by conservation tillage. Returning crop residue and adding animal manure help to maintain organic-matter content, medium. Available water capacity is high. Reaction in the surface layer varies with local liming practices but is commonly slightly acid. The subsoil is medium acid. Natural fertility is medium, and organic-matter content is low. The surface layer is friable and easily tilled over a relatively wide range of moisture content. It has a tendency to crust or puddle, however, after hard rains.



gravelly loam. In places the surface layer is thicker and darker. In some areas the subsoil is thinner and sand and gravel are closer to the surface. Some areas contain stratified sand and silt outwash. In some areas the surface layer that can withstand heavy foot traffic. There are few limitations for the construction and placement of camp areas, picnic areas, trails, footpaths, and bridle paths. Leveling is needed before this soil can be used for



suited to dwellings with basements. Frost heave is a problem for constructing local streets and roads, but this problem can be minimized by replacing subgrade material. This soil is well suited to installation of septic tank absorption fields. Care must be taken in selecting sites for waste disposal because of the rapid permeability of the underlying material. Ground water contamination is a possibility if sanitary facilities are constructed on this soil.

This soil is well suited to recreation uses. The nearly level surface, good drainage, and silt loam texture provide a firm surface that can withstand intensive foot traffic. There are no soil limitations for the construction and placement of playgrounds, camp areas, picnic areas, trails, footpaths, and bridle paths. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability class I.

792B—Bowes silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on side slopes, convex ridges, and knolls. Areas are oval and range from 5 to 160 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsurface layer is dark brown silt loam about 5 inches thick. The subsoil is about 36 inches thick. The upper part is dark brown silty clay loam, the middle part is dark yellowish brown gravelly clay loam, and the lower part is brown and dark brown gravelly clay loam and gravelly sandy loam. The underlying material, to a depth of 60 inches, is calcareous, brown gravelly sand. In places the surface layer is thinner and lighter in color. In some areas depth to calcareous sand and gravel is greater and the subsoil is thinner. The underlying material contains stratified, loamy outwash in some areas.

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

improve natural fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. It does not have sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is usually below a depth of 5 feet. Water moves downward through the surface layer and subsoil at a moderate rate.

This soil is only moderately suited to dwellings without basements because of the instability in the subsoil, but this problem can be corrected by strengthening foundations or replacing the base material. This soil is well suited to dwellings with basements. Frost heave is a problem for constructing streets and roads, but it can be minimized by replacing subgrade material. This soil is well suited to septic tank absorption fields. Care must be taken in selecting sites for waste disposal because of the rapid permeability of the underlying material. Ground water contamination is a possibility if sanitary facilities are installed.

This soil is well suited to most recreation uses. Good drainage and the silt loam texture provide a firm surface that can withstand heavy foot traffic. There are no soil limitations for the construction and use of camp areas, picnic areas, trails, footpaths, and bridle paths. Some leveling may be required before this soil is suited to playgrounds. Proper placement of trees, shrubs, and other vegetation reduces dust in dry weather. Capability subclass IIe.

792C—Bowes silt loam, 5 to 10 percent slopes. This moderately sloping, well drained soil is on convex ridges and side slopes. Areas are oblong and range from 5 to 100 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 6 inches thick. The subsurface layer is dark brown silt loam about 4 inches thick. The subsoil is about 34 inches thick. The upper part is dark yellowish

surface layer is friable and easily tilled over a relatively wide range of moisture content.

Most areas of this soil are farmed, but some areas in the eastern part of the county are used for urban development. The potential is fair to good for crops and fair for most urban uses.

This soil is suited to corn, soybeans, wheat, and oats and to grasses and legumes grown for hay and pasture. Erosion is the main hazard if the soil is used for cultivated crops. Minimum tillage, terracing, contouring, and grassed waterways help to reduce soil loss. Returning crop residue to the soil and adding animal manure help to maintain organic-matter content, improve fertility and tilth, increase water infiltration, and reduce soil loss.

This soil is well suited to urban development if proper design and installation procedures are used. It does not have sufficient stability because it has high frost heave potential and the subsoil has moderate shrink-swell potential. The water table is usually below a depth of 5 feet.

Because of irregular topography, gravel pits that are not mined are suited to recreation. Water-filled pits can be stocked with fish, for example.

921B—Faxon-Ripon complex, 0 to 5 percent slopes. This map unit consists of level and nearly level, poorly drained Faxon soils on flood plains and gently sloping, well drained Ripon soils on ridges and side slopes adjacent to the Fox River. Small islands in the Fox River are dominantly Faxon soils. Some areas of the complex are dissected by deep or moderately deep drainageways. Areas range from 5 to several hundred acres size. This complex is 50 to 65 percent Faxon soils, 20 to 30 percent Ripon soils, and 10 to 25 percent included soils. The soils are in areas so narrow or so small that it is not practical to separate them in mapping.

Typically, the Faxon soil has a surface layer of black and very dark gray clay loam about 13 inches thick. The subsoil is about 15 inches thick. The upper part is mottled, dark gray clay loam, and the lower part is mottled,

Faxon soils can be planted to grasses suitable for wetland wildlife. Cottonwoods and willows grow well on these soils. Oak can be planted if competing vegetation is controlled or removed. Ripon soils can be planted to grasses and legumes suitable for openland and woodland wildlife. These soils are well suited to pine, spruce, oaks, and cedars.

This complex is moderately suited to cropland, but high quality forage can be produced. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth and decreases water infiltration.

The soils in this complex can be made suitable for some urban uses if proper design and installation procedures are used. In Faxon soils depth to the seasonal water table

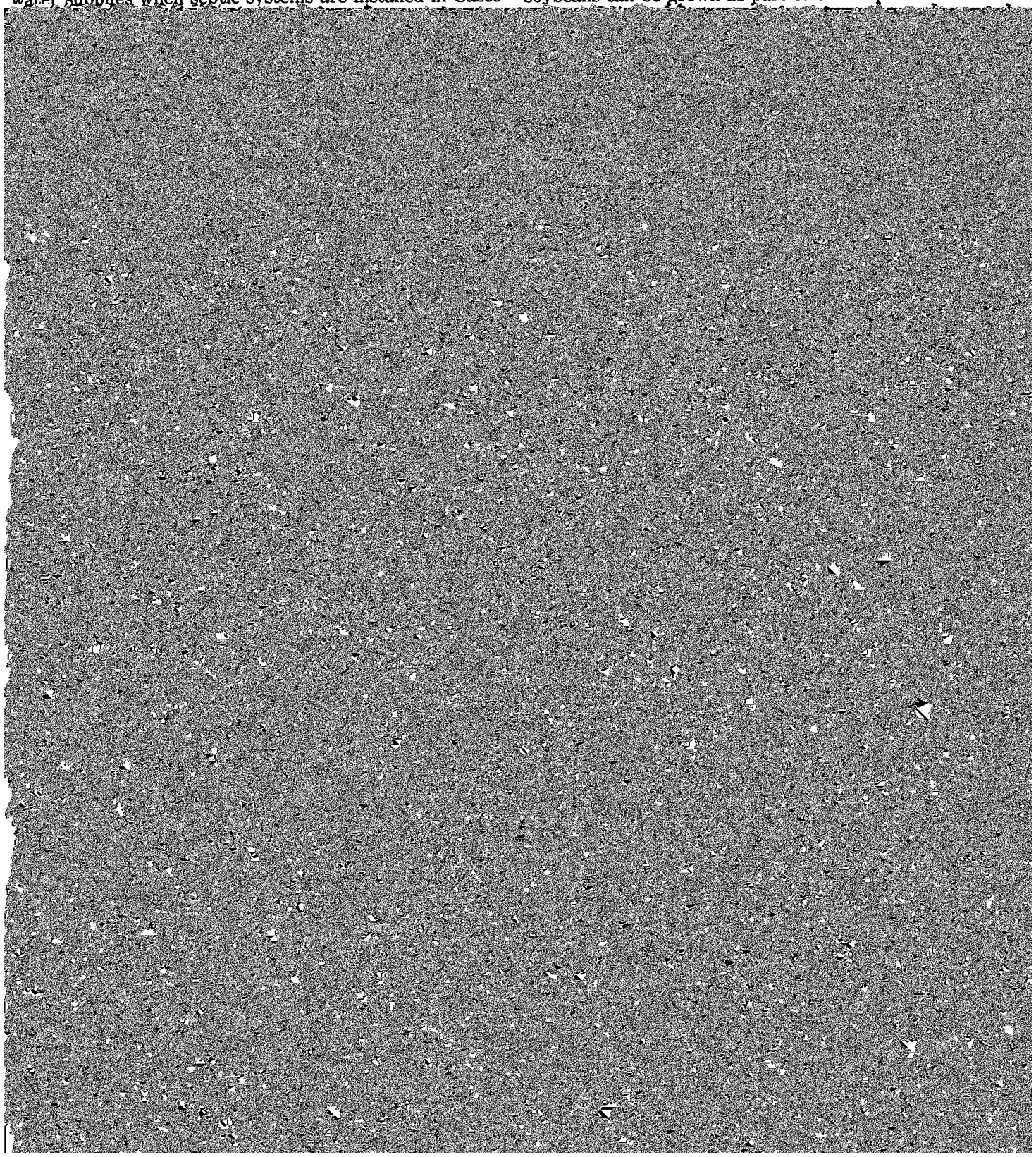
60 inches, is calcareous, yellowish brown loam till. In places the surface layer is thicker and darker. In places depth to the underlying calcareous loam till is greater and the subsoil is thicker.

Typically, the Casco soil has a surface layer of brown to dark brown loam about 7 inches thick. The subsoil is about 15 inches thick. The upper part is brown to dark brown clay loam, and the lower part is dark yellowish brown sandy clay loam. The underlying material, to a depth of 60 inches, is yellowish brown, calcareous gravelly sand. In places the surface layer is thicker and darker. In places depth to the underlying calcareous gravelly sand is greater or loamy outwash is in the underlying material.

Included with this complex in mapping are small areas

absorption fields. Because of the very rapidly permeable underlying material, there is potential pollution of ground water supplies when septic systems are installed in Casco

This unit is best suited to grasses and legumes grown for hay and pasture. On strongly sloping soils, corn and soybeans can be grown as part of the crop rotation if ero-



Typically, this soil is undrained and has standing water during much of the year. Sedges, rushes, and willows are the predominant vegetation. This soil consists of several layers, or tiers, of black, decomposed organic material which have a total thickness of 60 inches. When rubbed between the fingers, the upper tiers are very dark brown. The lower tiers contain dark brown, partly decomposed plant fibers. The underlying material is at a depth of more than 60 inches and is commonly sedimentary peat, silt loam, sandy loam, and silty clay loam. In some areas free carbonates are at or near the surface. In other places the surface layer is thinner and dark colored and contains less organic matter.

Included with this soil in mapping are small areas of poorly drained Drummer soils. They occupy drainageways and make up 10 to 15 percent of the unit.

Water and air move through this soil at a rapid rate, and runoff is very slow. Reaction is neutral or slightly acid. Organic-matter content is very high, and natural fertility is low and medium. The soil is usually too wet for cultivation.

Most areas of this soil are idle. The potential is poor for cultivated crops and very poor for most urban uses.

This soil is difficult to drain sufficiently to cultivate. It is on the lower landscape positions, and suitable outlets are generally not available. Tile lines are difficult to install and maintain. Surface ditches are beneficial in some areas, but unless the water table is controlled, wind erosion and subsidence result.

This soil is very poorly suited to most urban uses. It is frequently saturated less than 1 foot below the surface. It is also subject to frequent flooding. It has low strength and low stability because of the high organic-matter content and high frost heave potential. Water moves downward through the soil at a rapid rate.

Alternative sites should be selected for urban development when possible. This soil lacks the [illegible] firm soil horizons that cause difficulty in excavation

the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, and woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land use pattern in harmony with the natural soil (*11*).

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or

tors, fertilizer companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning". Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

About 253,926 acres of Kane county was farmland in 1974 (4). Of this, 106,218 acres was in corn, 69,358 acres in soybeans, 14,064 acres in wheat and oats, 15,614 acres in hay, 2,795 acres in other crops, mainly vegetables, 9,312 acres in pasture, and 36,555 acres in woods, waste, and idle land.

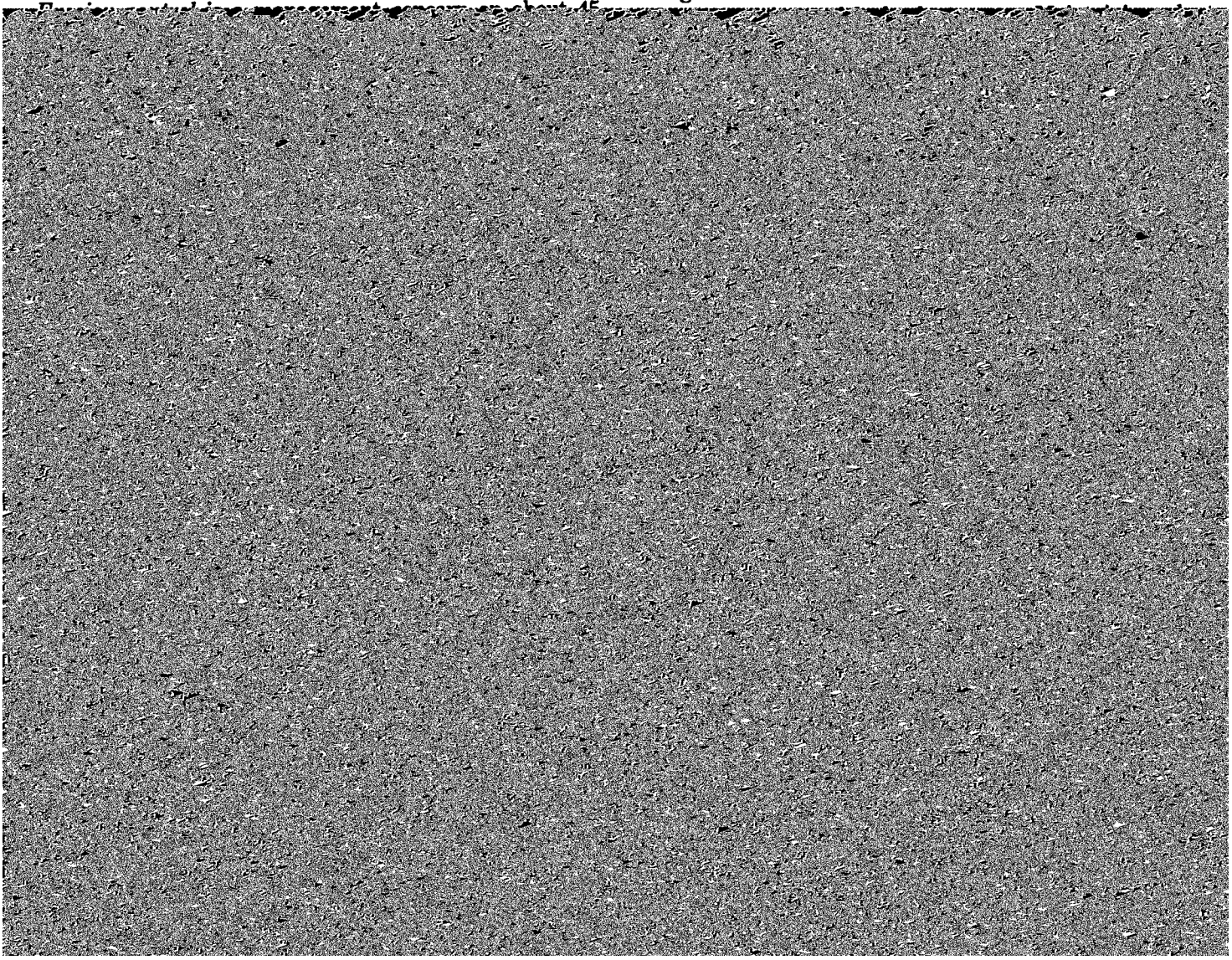
The acreage in crops and pasture has gradually decreased in recent years as more land is used for urban development. In 1974, the urban land in the county was about 75,000 acres. The most dramatic increases have occurred since 1965. The use of this soil survey to help make land use decisions that will influence the future role of farming in the county is discussed in the section "General soil map for broad land use planning".

and St. Charles soils. Some soils, such as Casco, Lorenzo, and Rodman soils, have irregular topography, and terraces generally are not practical. Some areas of most of the sloping soils in the county can be terraced.

Where slopes are not long and smooth enough for terraces, cropping systems must provide substantial plant cover. Minimum tillage and leaving crop residue on the surface help to increase infiltration and reduce runoff and erosion. These practices can be adapted to all of the soils in the county. No-tillage is also effective in controlling erosion and is increasing in popularity.

Farming on the contour and contour stripcropping are also increasing. Like terracing, these practices are best suited to soils that have smooth, uniform slopes. Some areas of most soils are suitable for contouring and contour stripcropping.

Wind erosion is a hazard on most of the nearly level soils in the county, but is particularly damaging to organic soils, such as Houghton and Lena soils. Wind erosion can damage these soils in a short time if wind is strong and



The organic Houghton and Lena soils have low to medium fertility. They require special fertility practices because they are low in inorganic nutrients.

About 21 percent of the soils in the county have medium natural fertility. These soils developed under forest and are low in content of organic matter. The most abundant soils in this group are Camden, Dodge, Fox, and Miami soils. Most of these soils respond well to fertilizer and produce high yields.

About 73 percent of the farmland has high fertility. These soils formed under or were influenced by prairie grasses. The most abundant soils in this group are Brenton, Drummer, Harvard, Octagon, Proctor, Saybrook, and Varna soils. For the most part, these soils have a deep rooting zone and high available water capacity. Some of the soils in the group are among the most productive in the world.

Tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils with good tilth are granular and porous. Most of the soils in the county have good tilth. Those with good tilth have a silt loam surface layer high in organic matter and have granular structure.

Soils low in organic matter generally have weak structure in the surface layer. Intense rainfall causes forma-

tension agents (*9*). Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed.

dicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms 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 too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability subclass is identified in the description of each soil map unit in the section "Soil maps for detailed planning."

Windbreaks and environmental plantings

Windbreaks are established to protect livestock, buildings, and yards from wind and snow. Windbreaks also help protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broad-leaved and coniferous species provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field, the interval depending on erodibility of the soil. They 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. A healthy planting stock of suitable species planted properly on a well prepared site and maintained in good condition can insure a high degree of plant survival.

Table 6 shows the height that locally grown trees and shrubs are expected to reach on various kinds of soil in 20 years. The estimates in table 6, based on measurements and observation of established plantings that have been given adequate care, can be used as a guide in planning windbreaks and screens. Additional information about planning windbreaks and screens and the planting and care of trees can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from nurserymen.

Engineering

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills,

onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 7 shows, for each kind of soil, the degree and kind of limitations for building site development; table 8, for sanitary facilities; and table 10, for water management. Table 9 shows the suitability of each kind of soil as a source of

open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 7 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and

In rating the soils, the availability of water for sprinkling is assumed.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 8 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil (*15*). Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent before it reaches the water table. Soils that have a seasonal high water table are not suitable for sewage lagoons unless the water table is below a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

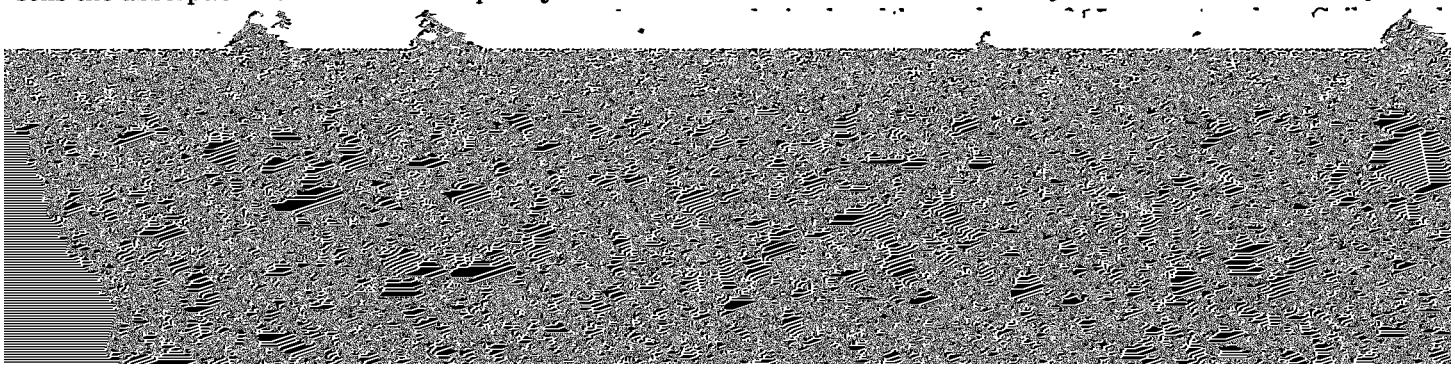
Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 9 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 13 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well



the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use

sive maintenance, limited use, or by a combination of these measures.

The information in table 11 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 8, and interpretations for dwellings without base-

In table 12, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable

buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are oak, ash, cherry, black walnut, apple, hawthorn, dogwood, hickory, blackberry, and sumac. Examples of fruit

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*1*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are [illegible]

Physical and chemical properties

Table 14 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the

modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can

water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low ru

the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of

The system of classification has six categories. Beginning with the broadest, these categories are the

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except

B21t—17 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; com-

IIB21t—11 to 16 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct yellowish brown (10YR 5/4) mottles; moderate dark brown (10YR 4/3) clay films on faces of peds; few fine rounded dark accumulations (Fe and Mn oxides); slightly acid; clear

A2—9 to 13 inches; yellowish brown (10YR 5/4) silt loam; weak thick platy structure parting to weak fine granular; friable; slightly acid; clear smooth boundary.

B21t—13 to 19 inches; brown (10YR 4/3) silty clay loam; moderate very fine and fine subangular blocky structure; firm; slightly acid; clear smooth boundary.

B22t—19 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; weak coarse prismatic structure parting to moderate fine subangular blocky; firm; thin continuous brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

B23t—28 to 36 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; thin continuous brown (10YR 4/3) clay films on faces of peds; medium acid; gradual smooth boundary.

B24t—36 to 43 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; thin continuous brown (10YR 4/3) clay films on faces of peds; few pebbles; medium acid; clear smooth boundary.

IIB31t—43 to 46 inches; brown (10YR 4/3) gravelly clay loam; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; firm; thin discontinuous dark yellowish brown (10YR 3/4) clay films as stains on grains; mildly alkaline; clear smooth boundary.

IIB32—46 to 51 inches; dark brown (7.5YR 3/2) gravelly sandy loam; weak medium subangular blocky structure; friable; mildly alkaline; clear smooth boundary.

IIC—51 to 61 inches; brown (7.5YR 4/4) gravelly sand; single grained; common dolomitic cobbles; strong effervescence; moderately alkaline.

The thickness of the silty mantle ranges from 36 to 55 inches. Thickness of the solum and depth to calcareous sand and gravel range from 40 to 65 inches.

The A horizon ranges from 7 to 13 inches in thickness. The Ap horizon has value of 2 or 3 and chroma of 1 to 3. The A2 horizon, where present, has value of 4 or 5 and chroma of 2 to 4. The B2t horizon has value of 4 or 5 and chroma of 3 to 6. It is slightly acid to strongly acid silty clay loam that is 27 to 35 percent clay. The IIB3 horizon is clay loam, sandy clay loam, gravelly clay loam, gravelly loam, or loam. The IIC horizon is moderately alkaline gravelly sand or gravelly sandy loam. It has value of 4 or 5 and chroma of 3 or 4.

Brenton series

The Brenton series consists of deep, somewhat poorly drained, moderately permeable soils on flats and knolls near drainageways on outwash plains. These soils formed in calcareous silt and the underlying loamy outwash. Slopes range from 0 to 3 percent.

Brenton soils are similar to Elburn and Millbrook soils. Elburn soils contain less sand in the B horizon than Brenton soils. Millbrook soils lack a mollic epipedon. Brenton soils commonly adjoin Drummer and Proctor soils on the landscape. Drummer soils are poorly drained, have a thicker mollic epipedon, and are at lower elevations on the landscape than Brenton soils. Proctor soils are well drained and moderately well drained and are more sloping than Brenton soils. They are on ridges at higher elevations.

Typical pedon of Brenton silt loam 270 feet north and 250 feet west of the southeast corner of sec. 36, T. 39 N., R. 6 E.

Ap—0 to 8 inches; black (10YR 2/1) silt loam; moderate medium granu-

A3—12 to 17 inches; very dark grayish brown (10YR 3/2) silt loam; few fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; firm; common thin very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; few dark accumulations (Fe and Mn oxides); neutral; clear smooth boundary.

B21t—17 to 24 inches; brown to dark brown (10YR 4/3) silty clay loam; common fine distinct grayish brown (2.5Y 5/2) and light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; firm; continuous thin dark grayish brown (10YR 4/2) organic coatings on faces of peds; common dark accumulations (Fe and Mn oxides); slightly acid; clear smooth boundary.

B22t—24 to 33 inches; brown to dark brown (2.5Y 4/3) silty clay loam; many coarse distinct grayish brown (2.5Y 5/2) and brownish yellow (10YR 6/8) mottles; moderate coarse subangular blocky structure; firm; patchy thin dark grayish brown (10YR 4/2) organic coatings on faces of peds; common dark accumulations (Fe and Mn oxides); slightly acid; abrupt smooth boundary.

IIB3—33 to 45 inches; grayish brown (2.5Y 5/2) loam; many medium distinct light olive brown (2.5Y 5/6) and brownish yellow (10YR 6/8) mottles; weak coarse subangular blocky structure; friable; common dark accumulations (Fe and Mn oxides); neutral; gradual smooth boundary.

IIC—45 to 60 inches; light olive brown (2.5Y 5/4) stratified sandy loam and loam; many coarse distinct grayish brown (2.5Y 5/2) and brownish yellow (10YR 6/8) mottles; massive; friable; slight effervescence; mildly alkaline.

The thickness of the solum and depth to free carbonates range from 40 to 60 inches. The depth to stratified loamy sediments ranges from 24 to 40 inches. The thickness of the mollic epipedon ranges from 10 to 18 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The B2t horizon has value of 4 or 5 and chroma of 2 or 3. Mottles are distinct. Reaction is slightly acid or neutral. The IIB3 horizon is silt loam, loam, fine sandy loam, or clay loam. The IIC horizon has value of 4 to 6 and chroma of 2 to 4, and is mottled. It is slightly acid to moderately alkaline loam, silt loam, or fine sandy loam.

Camden series

The Camden series consists of deep, well drained and moderately well drained, moderately permeable soils on outwash plains. These soils formed in calcareous, silty loess and the underlying, stratified, loamy outwash. Slopes range from 0 to 10 percent.

Camden soils are similar to Martinsville and St. Charles soils. Martinsville soils have more sand in the upper part of the solum than Camden soils, and St. Charles soils contain less sand to a depth of 40 inches. St. Charles soils also have a thicker loess cover. Camden soils commonly adjoin Millbrook and Drummer soils on the landscape. Millbrook soils are somewhat poorly drained and are at lower elevations than Camden soils. Drummer soils are poorly drained and have a mollic epipedon.

Typical pedon of Camden silt loam, 2 to 5 percent slopes, 670 feet south and 330 feet west of the northeast corner of sec. 8, T. 41 N., R. 8 E.

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

A2—7 to 11 inches; brown (10YR 5/3) silt loam; moderate fine granular structure; friable; medium acid; clear smooth boundary.

B1t—11 to 16 inches; brown to dark brown (10YR 4/3) silty clay loam;

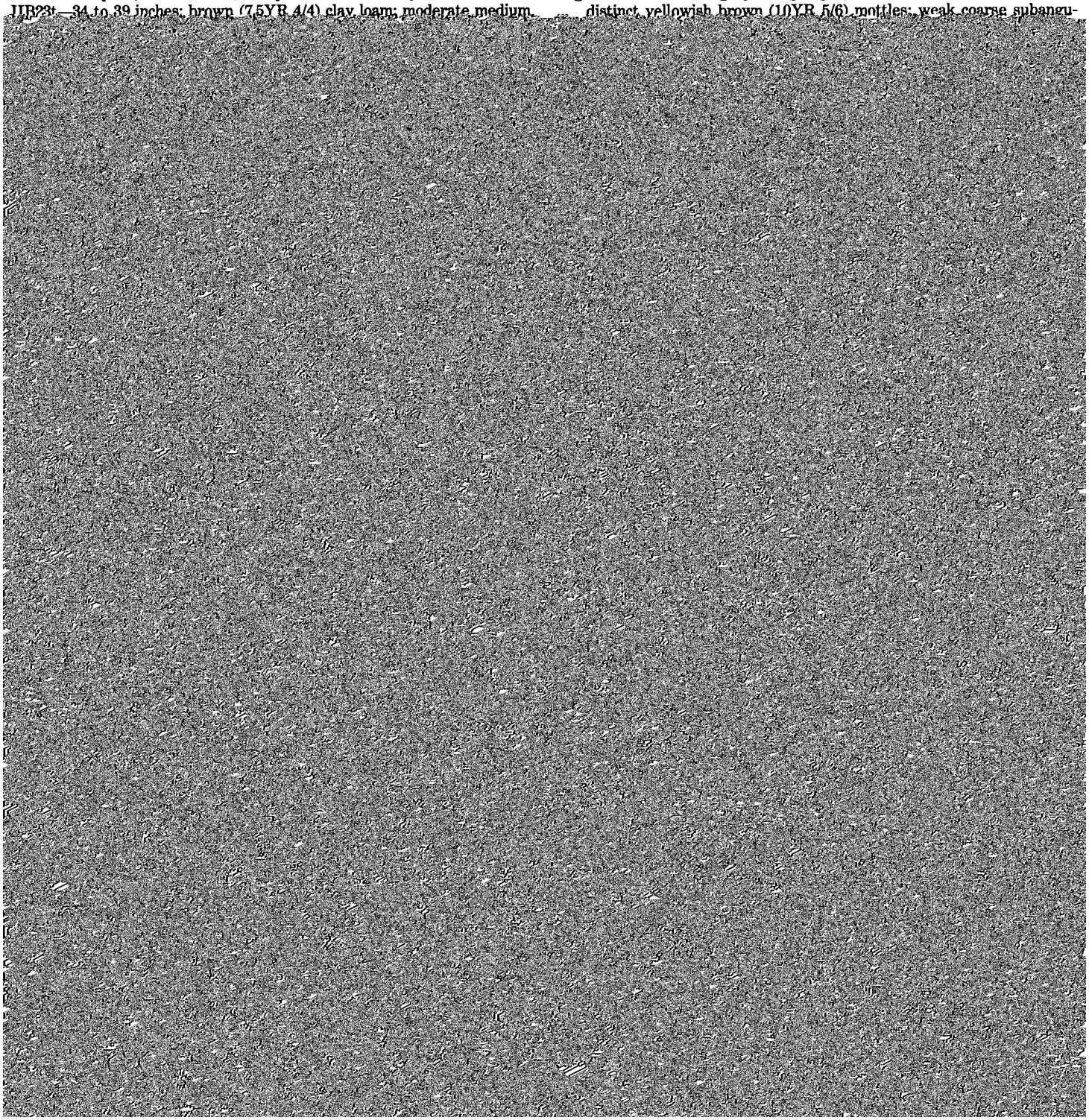
B21t—16 to 26 inches; brown to dark brown (10YR 4/3) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; continuous thin dark grayish brown (10YR 4/2) clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—26 to 34 inches; brown (7.5YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; continuous moderately thick dark brown (7.5YR 4/2) films on faces of peds; medium acid; abrupt smooth boundary.

IIB23t—34 to 39 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky; friable; common fine irregular lime accumulations; few snail shells; slight effervescence; mildly alkaline; clear smooth boundary.

B22g—28 to 35 inches; gray (5Y 5/1) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; many fine irregular lime accumulations; few snail shells; strong effervescence; moderately alkaline; abrupt smooth boundary.

C1g—35 to 46 inches; gray to light gray (5Y 6/1) loam; common coarse distinct yellowish brown (10YR 5/6) mottles; weak coarse subangu-



of 3 or 4. The IIC horizon has value of 4 or 5 and chroma of 3 or 4. Reaction is moderately alkaline or mildly alkaline.

Catlin series

The Catlin series consists of deep, well drained and moderately well drained, moderately permeable soils on till plains. These soils formed in calcareous, silty loess and the calcareous, underlying loam till. Slopes range from 0 to 5 percent.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The B2t horizon has value of 4 or 5 and chroma of 3 to 6. The IIB3 horizon is clay loam, loam, or silt loam. The IIC horizon has value of 5 or 6 and chroma of 3 or 4. Reaction is mildly alkaline or moderately alkaline.

Dodge series

The Dodge series consists of deep, well drained, moderately permeable soils on end moraines. These soils formed in calcareous, silty loess and the calcareous, un-

Dresden series

The Dresden series consists of well drained soils on uplands and terraces. These soils are moderately permeable in the solum and rapidly permeable in the underlying material. They formed in loamy outwash and are underlain by gravelly sand. They are moderately deep to the gravelly sand. Slopes range from 0 to 10 percent.

Dresden soils are similar to Fox and Warsaw soils and commonly adjoin Fox and Kane soils on the landscape. Fox soils have a lighter colored A horizon and are at higher elevations than Dresden soils. Warsaw soils have a mollic epipedon and are on broad flats adjacent to Dresden soils. Kane soils are somewhat poorly drained, have a mollic epipedon, and are in shallow depressions.

Typical pedon of Dresden silt loam, 0 to 2 percent slopes, 720 feet south and 1,340 feet west of the center of sec. 21, T. 41 N., R. 8 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam; weak very fine granular structure; friable; slightly acid; abrupt smooth boundary.

B1—7 to 11 inches; brown to dark brown (10YR 4/3) silty clay loam; weak very fine subangular blocky structure; friable; neutral; clear smooth boundary.

B21t—11 to 19 inches; brown to dark brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; slightly acid; clear smooth boundary.

IIB22t—19 to 27 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; thin continuous brown to dark brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

IIB3—27 to 32 inches; mixed dark yellowish brown (10YR 4/4) and brown to dark brown (7.5YR 4/2) sandy clay loam; weak coarse subangular blocky structure; friable; neutral; abrupt smooth boundary.

IIC—32 to 60 inches; yellowish brown (10YR 5/4) gravelly sand; single grained; loose; strong effervescence; moderately alkaline.

Typical pedon of Drummer silty clay loam, 990 feet north and 270 feet west of the southeast corner of sec. 11, T. 38 N., R. 7 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam; weak fine granular structure; friable; neutral: abrupt smooth boundary.

A12—8 to 13 inches; black (10YR 2/1) silty clay loam; moderate fine subangular blocky structure parting to weak fine granular; friable; slightly acid; clear smooth boundary.

B1—13 to 21 inches; very dark gray (10YR 3/1) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; common thin black (10YR 2/1) organic coatings and stains on faces of peds; slightly acid; clear smooth boundary.

B21g—21 to 28 inches; dark gray (10YR 4/1) silty clay loam; common fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; firm; thick black (10YR 2/1) krotovina; neutral; clear smooth boundary.

B22g—28 to 36 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct light olive brown (2.5Y 5/4 and 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common thick very dark grayish brown (10YR 3/2) organic coatings lining pores and common thin dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; clear smooth boundary.

B23g—36 to 43 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/8) mottles; fine medium prismatic structure; firm; few thin dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; abrupt smooth boundary.

IIB3g—43 to 50 inches; gray (5Y 5/1) sandy loam; few fine distinct brownish yellow (10YR 6/8) and light olive brown (2.5Y 5/4) mottles; weak coarse subangular blocky structure; friable; neutral; clear smooth boundary.

IIC1g—50 to 58 inches; gray (5Y 5/1) sandy loam; common medium distinct light olive brown (2.5Y 5/4) and brownish yellow (10YR 6/8) mottles; single grained; friable; neutral; abrupt smooth boundary.

IIC2g—58 to 70 inches; grayish brown (2.5Y 5/2) loam; many medium distinct yellowish brown (10YR 5/8 and 5/4) mottles; massive; friable; slight effervescence; mildly alkaline.

The thickness of the solum and depth to free carbonates range from

Ap—0 to 9 inches; black (10YR 2/1) silt loam, weak very fine granular structure; friable; neutral; clear smooth boundary.

A12—9 to 12 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable; neutral; clear smooth boundary.

B1t—12 to 19 inches; brown and dark brown (10YR 4/3) silty clay loam; medium subangular blocky structure; firm; continuous thin very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

IIB22t—17 to 22 inches; brown to dark brown (10YR 4/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; continuous

IIR—28 inches; dolomitic limestone bedrock.

The thickness of the solum and depth to limestone bedrock range from 24 to 40 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 2 or 3 and chroma of 1. It is commonly

Thickness of loess ranges from 40 to 55 inches, and thickness of the solum and depth to free carbonates range from 44 to 60 inches. Thickness of the mollic epipedon ranges from 10 to 16 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The B2t horizon has value of 4 to 6 and chroma of 2 to 4. It is 35 to 40 percent clay. Reaction is neutral or slightly acid. The IIB3 horizon is clay loam

sandy clay loam, or loam. The B2t and IIB2t horizons are 27 to 35 percent clay. Reaction is slightly acid or medium acid. They have value of 3 or 4 and chroma of 3 to 5. The IIC horizon has value of 4 to 6 and chroma of 3 or 4.

Harpster series

careous, silty loess and the underlying, stratified loamy outwash. Slopes range from 0 to 10 percent.

Harvard soils are similar to Camden and Proctor soils. Camden soils have a lighter colored surface layer. Proctor soils have a mollic epipedon. Harvard soils commonly adjoin Camden, Drummer, and Millbrook soils on the land-

Typical pedon of Herbert silt loam, 300 feet south and 235 feet west of the center of sec. 22, T. 39 N., R. 7 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A2—8 to 12 inches; dark grayish brown (10YR 4/2) silt loam; very weak medium platy structure parting to weak medium subangular blocky; friable; common thin very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded dark accumulations (Fe and Mn oxides); slightly acid; clear smooth boundary.

B21t—12 to 19 inches; brown to dark brown (10YR 4/3) silty clay loam; common fine faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; many thin dark grayish brown (2.5Y 4/2) organic coatings and clay films on faces of peds; few fine rounded dark accumulations (Fe and Mn oxides); slightly acid; clear smooth boundary.

B22t—19 to 27 inches; brown (10YR 5/3) silty clay loam; common medium distinct brownish yellow (10YR 6/8) mottles; moderate fine angular blocky structure; firm; many thin grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded dark accumulations (Fe and Mn oxides); medium acid; clear smooth boundary.

IIB23t—27 to 35 inches; brown (10YR 5/3) clay loam; many coarse faint yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; many thin grayish brown (2.5Y 5/2) clay films on faces of peds; common medium rounded dark accumulations (Fe and Mn oxides); few dolomitic pebbles; neutral; clear smooth boundary.

IIB3t—35 to 39 inches; yellowish brown (10YR 5/4) clay loam; many coarse distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; very weak coarse subangular blocky structure; friable; common dolomitic pebbles; slight effervescence; mildly alkaline; clear smooth boundary.

IIC—39 to 60 inches; light yellowish brown (10YR 6/4) loam; common medium distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; massive; friable; few medium light gray (10YR 7/1) lime accumulations; common dolomitic pebbles; strong effervescence; moderately alkaline.

The thickness of the loess ranges from 20 to 38 inches, and thickness of the solum and the depth to free carbonates range from 24 to 40 inches.

The A horizon ranges from 11 to 14 inches in thickness. The Ap horizon has value of 2 or 3 and chroma of 1 to 3. The A2 horizon has value of 4 or 5 and chroma of 1 or 2. The B2t horizon, which formed in loess, is silty clay loam. The IIB2t horizon, which formed in glacial till, is clay loam. The B2t and IIB2t horizons have value of 4 or 5 and chroma of 2 to 6. They are 27 to 35 percent clay. Reaction is medium acid to neutral. The IIB3 horizon, where present, is light clay loam or heavy loam. The IIC horizon has value of 4 to 6 and chroma of 2 to 6. Reaction is moderately alkaline or mildly alkaline.

Houghton series

The Houghton series consists of deep, very poorly

Oa2—10 to 15 inches; black (10YR 2/1) broken face sapric material; weak very fine granular structure; very friable; neutral; clear smooth boundary.

Oa3—15 to 32 inches; black (10YR 2/1) broken face sapric material; weak very fine granular structure; very friable; neutral; abrupt smooth boundary.

Oa4—32 to 37 inches; black (10YR 2/1) broken face and very dark brown (7.5YR 2/2) rubbed sapric material; massive parting to weak fine granular structure; very friable; neutral; clear smooth boundary.

Oa5—37 to 49 inches; black (10YR 2/1) broken face sapric material with common dark brown (7.5YR 3/2) fibers; massive parting to weak fine granular structure; very friable; neutral; clear smooth boundary.

Oa6—49 to 65 inches; black (10YR 2/1) broken face sapric material and common dark brown (7.5YR 3/2) fibers; massive; very friable; neutral.

The organic layers are more than 51 inches thick and are primarily herbaceous. Some pedons contain woody fragments, which can not be crushed between the fingers.

Layers within the control section have value of 2 or 3 and chroma of 0 to 3. Reaction is slightly acid or neutral. The surface tier is dominantly sapric material but includes hemic material also. The subsurface tiers are dominantly sapric material. Hemic material in these tiers are less than 10 inches thick, and fiberic materials are less than 5 inches thick.

Kane series

The Kane series consists of somewhat poorly drained soils on outwash plains and terraces. These soils are moderately permeable in the solum and rapidly permeable in the underlying material. They are moderately deep to gravelly sand. They formed in loamy outwash and are underlain by gravelly sand. Slopes range from 0 to 3 percent.

Kane soils are similar to Brenton soils; however, Brenton soils contain less sand and gravel in the solum and underlying material. Kane soils commonly adjoin Dresden, Fox, and Warsaw soils on the landscape. Dresden and Fox soils are well drained, lack a mollic epipedon, and are on ridges and side slopes. Warsaw soils are well drained and are on ridgetops.

Typical pedon of Kane silt loam, 270 feet south and 880 feet east of the center of sec. 4, T. 42 N., R. 6 E.

Ap—0 to 8 inches; black (10YR 2/1) silt loam; moderate fine granular structure; friable; neutral; clear smooth boundary.

A3—8 to 11 inches; very dark gray (10YR 3/1) loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

mon dolomitic pebbles of gravel and cobblestones; mildly alkaline; clear smooth boundary.

IIC—33 to 60 inches; grayish brown (2.5Y 5/2) gravelly sand; common medium distinct light olive brown (2.5Y 5/6) mottles; single grained; loose dolomitic pebbles of gravel and many cobblestones; moderately alkaline.

The thickness of the solum and the depth to sand and gravel range from 24 to 40 inches. Thickness of the mollic epipedon ranges from 10 to 14 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is commonly silt loam, but includes loam and sandy loam. The B2t horizon has value of 4 to 6 and chroma of 2 to 4, and has distinct mottles. It is clay loam or sandy clay loam that is 27 to 35 percent clay. Reaction is slightly acid to mildly alkaline. The IIC horizon is gravelly sand. Reaction is moderately alkaline. It has value of 4 to 6 and chroma of 2 to 6.

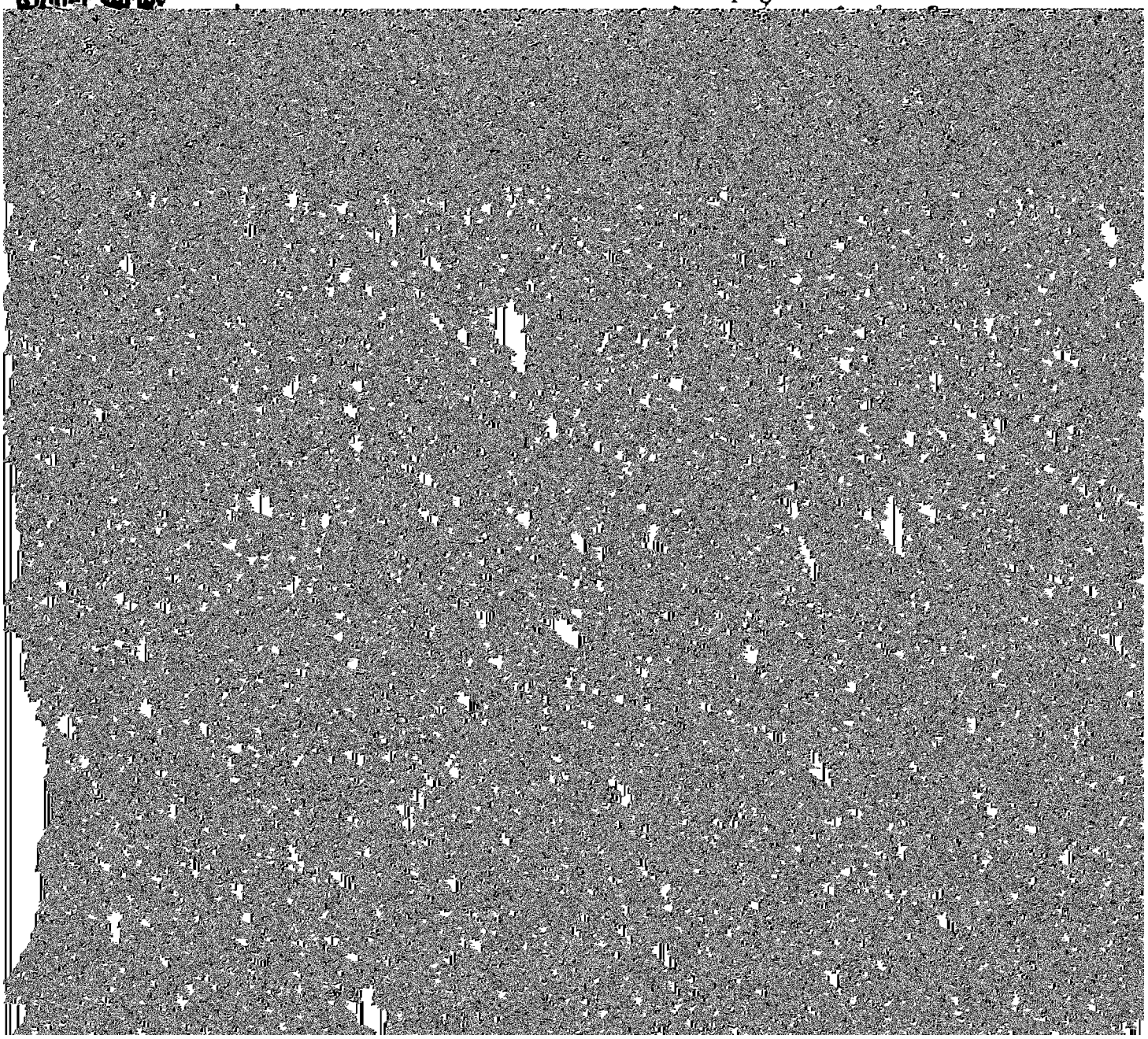
Kidder series

sandy loam. The C horizon has value of 5 or 6 and chroma of 3 to 6. It is mildly alkaline or moderately alkaline.

La Rose series

The La Rose series consists of deep, well drained and moderately well drained soils on end moraines. These soils formed in calcareous, loam till. Slopes range from 5 to 15 percent.

La Rose soils are similar to Octagon soils. Octagon soils lack a mollic epipedon and have a thicker solum. La Rose soils commonly adjoin Lisbon and Saybrook soils on the landscape. Lisbon soils have a thicker solum and are in shallow depressions. Saybrook soils have a thicker solum and are less sloping than La Rose soils.



Oa3—19 to 30 inches; black (N 2/0) broken face and dark reddish brown (5YR 2/2) rubbed sapric material; 15 to 20 percent fibers; massive parting to weak medium subangular blocky; very friable; few snail shells; strong effervescence; moderately alkaline; gradual smooth boundary.

Oa4—30 to 38 inches; black (10YR 2/1) broken face and dark reddish brown (5YR 2/2) rubbed sapric material; 15 percent fibers; massive parting to weak coarse subangular blocky; friable; few lime accumulations; strong effervescence; moderately alkaline; gradual smooth boundary.

Oa5—38 to 55 inches; black (10YR 2/1) broken face and dark reddish brown (5YR 2/2) rubbed sapric material; 15 percent fibers; massive; friable; few lime accumulations; about 5 percent gray to light gray (10YR 6/1) limnic material; strong effervescence; moderately alkaline; clear smooth boundary.

Oa6—55 to 60 inches; black (10YR 2/1) broken face and very dark brown (10YR 2/2) rubbed sapric material; 10 percent fibers; massive; very friable; common lime accumulations; about 20 percent gray to light gray (10YR 6/1) limnic material; violent effervescence; moderately alkaline.

The organic layers are more than 51 inches thick and are primarily herbaceous. In some pedons hemic layers have a higher value or chroma in the control section.

Layers within the control section have value of 2 or 3 and chroma of 0 to 3. Reaction is moderately alkaline in most tiers, but some are mildly alkaline. Hemic or fibric materials in the subsurface tiers have a total thickness of less than 5 inches. Layers within the control section have strong or violent effervescence.

Lisbon series

The Lisbon series consists of deep, moderately permeable, somewhat poorly drained soils on knolls and in shallow depressions on till plains. These soils formed in calcareous, silty loess and the calcareous, underlying loam till. Slopes range from 0 to 3 percent.

Lisbon soils are similar to Herbert soils. Herbert soils lack mollic epipedons. Lisbon soils commonly adjoin Drummer and Saybrook soils on the landscape. Drummer soils are poorly drained and are on flats and in depressions of uplands. Saybrook soils are well drained and moderately well drained and are at higher elevations than Lisbon soils.

Typical pedon of Lisbon silt loam, 870 feet north and 250 feet west of the center of sec 15, T. 39 N., R. 7 E.

Ap—0 to 8 inches; black (10YR 2/1) silt loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

A12—8 to 13 inches; very dark gray (10YR 3/1) silt loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

B1t—13 to 19 inches; brown to dark brown (10YR 4/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; common thin dark grayish brown (10YR 4/2) and patchy thin very dark gray (10YR 3/1) organic coatings on faces of peds and as stains on grains; neutral; clear smooth boundary.

B21t—19 to 26 inches; brown (10YR 5/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common thin grayish brown (10YR 5/2) clay films on faces of peds; slightly acid; clear smooth boundary.

B22t—26 to 31 inches; brown (10YR 5/3) silty clay loam; few fine distinct dark grayish brown (10YR 4/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; patchy thin very dark grayish brown (10YR 3/2) organic coatings as stains on faces of peds; neutral; abrupt smooth boundary.

IIB23t—31 to 36 inches; brown (10YR 5/3) clay loam; few fine distinct dark grayish brown (10YR 4/2) mottles; moderate coarse prismatic structure parting to moderate coarse subangular blocky; firm; discontinuous moderately thick very dark grayish brown (10YR 3/2) organic coatings and clay films on faces of peds; few dolomitic pebbles; neutral; clear smooth boundary.

IIB3—36 to 39 inches; yellowish brown (10YR 5/4) loam; common fine distinct yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) mottles; weak coarse subangular blocky structure; firm; few thin very dark grayish brown (10YR 3/2) organic coatings lining pores; few dolomitic pebbles; slight effervescence; mildly alkaline; abrupt smooth boundary.

IIC—39 to 60 inches; light yellowish brown (10YR 6/4) loam; common medium distinct brownish yellow (10YR 6/6) and light brownish gray (10YR 6/2) mottles; massive; friable; few fine light gray (10YR 7/1) lime accumulations; common dolomitic pebbles; strong effervescence; moderately alkaline.

Thickness of the loess mantle ranges from 20 to 40 inches, and thickness of the solum and depth to free carbonates range from 22 to 40 inches. Thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The IIB2t horizon, formed in glacial till, is clay loam. The B2t and IIB2t horizons have value of 4 or 5 and chroma of 2 to 6, and is mottled. They are 27 to 35 percent clay. Reaction is medium acid to neutral in the upper part and slightly acid to moderately alkaline in the lower part. The IIB3 horizon, where present, is heavy loam or light clay loam. The IIC horizon has value of 4 to 6 and chroma of 2 to 6. Reaction is mildly alkaline or moderately alkaline.

Lorenzo series

The Lorenzo series consists of well drained soils on outwash plains and terraces. These soils are moderately rapidly permeable in the solum and rapidly permeable in the underlying material. They formed in a thin layer of loamy outwash and are underlain by calcareous sand and gravel. Slopes range from 0 to 10 percent.

Lorenzo soils are similar to Casco and Warsaw soils. Casco soils lack mollic epipedons. Lorenzo soils commonly adjoin Kane, Warsaw, and Will soils. Kane soils are somewhat poorly drained and are at lower elevations than Lorenzo soils. Warsaw soils have a thicker solum and typically are less sloping than Lorenzo soils. Will soils are poorly drained and are also at lower elevations than Lorenzo soils.

Typical pedon of Lorenzo loam, 0 to 2 percent slopes, 650 feet north and 1,230 feet east of the center of sec. 4, T. 42 N., R. 6 E.

Ap—0 to 8 inches; very dark brown (10YR 2/2) loam; weak very fine granular structure; very friable; neutral; abrupt smooth boundary.

A3—8 to 13 inches; very dark grayish brown (10YR 3/2) loam; weak very fine granular structure; friable; neutral; clear smooth boundary.

Bt—13 to 21 inches; brown to dark brown (10YR 4/3) loam; weak fine subangular blocky structure; patchy thin very dark brown (10YR 3/2) clay films on faces of peds; friable; neutral; abrupt smooth

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is dominantly loam, but includes sandy loam and silt loam. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It is loam, clay loam, gravelly clay loam, or sandy clay loam that is 27 to 35 percent clay. The IIC horizon has value of 4 or 5 and chroma of 3 or 4.

Markham series

Martinsville soils are similar to Camden and Fox soils, and commonly adjoin Camden, Fox, and Selma soils on the landscape. Camden soils contain less sand in the upper solum than Martinsville soils. Fox soils are underlain by gravel. The poorly drained Selma soils have a thicker mollic epipedon and are on flats and in drainageways at lower elevations than Martinsville soils.

Typical pedon of Miami silt loam, 2 to 5 percent slopes, 90 feet north and 2,145 feet west of the southeast corner of sec. 29, T. 41 N., R. 7 E.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam; weak very fine granular structure; friable; neutral; abrupt smooth boundary.

A2—4 to 11 inches; brown (10YR 5/3) silt loam; weak thick platy structure; friable; neutral; abrupt smooth boundary.

IIB21t—11 to 15 inches; brown to dark brown (7.5YR 4/4) clay loam; moderate very fine and fine angular blocky structure; firm; medium acid; clear smooth boundary.

IIB22t—15 to 21 inches; reddish brown (5YR 4/4) clay loam; moderate fine angular blocky structure; firm; discontinuous dark reddish brown (5YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

IIB23t—21 to 29 inches; reddish brown (5YR 4/4) clay loam; moderate medium angular blocky structure; firm; discontinuous dark reddish brown (5YR 3/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

IIB3—29 to 39 inches; reddish brown (5YR 4/4) clay loam; weak medium and coarse subangular blocky structure; friable; mildly alkaline; abrupt smooth boundary.

IIC—39 to 60 inches; brown (7.5YR 5/4) loam; massive; friable; strong effervescence; moderately alkaline.

The thickness of the loess is less than 18 inches, and thickness of the solum ranges from 24 to 42 inches. Depth to carbonates ranges from 20 to 38 inches.

The A horizon ranges from 7 to 12 inches in thickness. Many pedons lack an A2 horizon in cultivated areas. The A1 horizon has value of 3

B21g—20 to 29 inches; dark gray (5Y 4/1) silty clay; common medium distinct light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/8) mottles; moderate medium angular blocky structure; very firm; common thin dark olive gray (5Y 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

B22g—29 to 38 inches; gray (5Y 5/1) silty clay loam; common medium distinct light olive brown (2.5Y 5/6) and prominent yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm; common thin dark gray (5Y 4/1) organic coatings on faces of peds and very dark gray (10YR 3/1) organic matter in krotovina; neutral; clear smooth boundary.

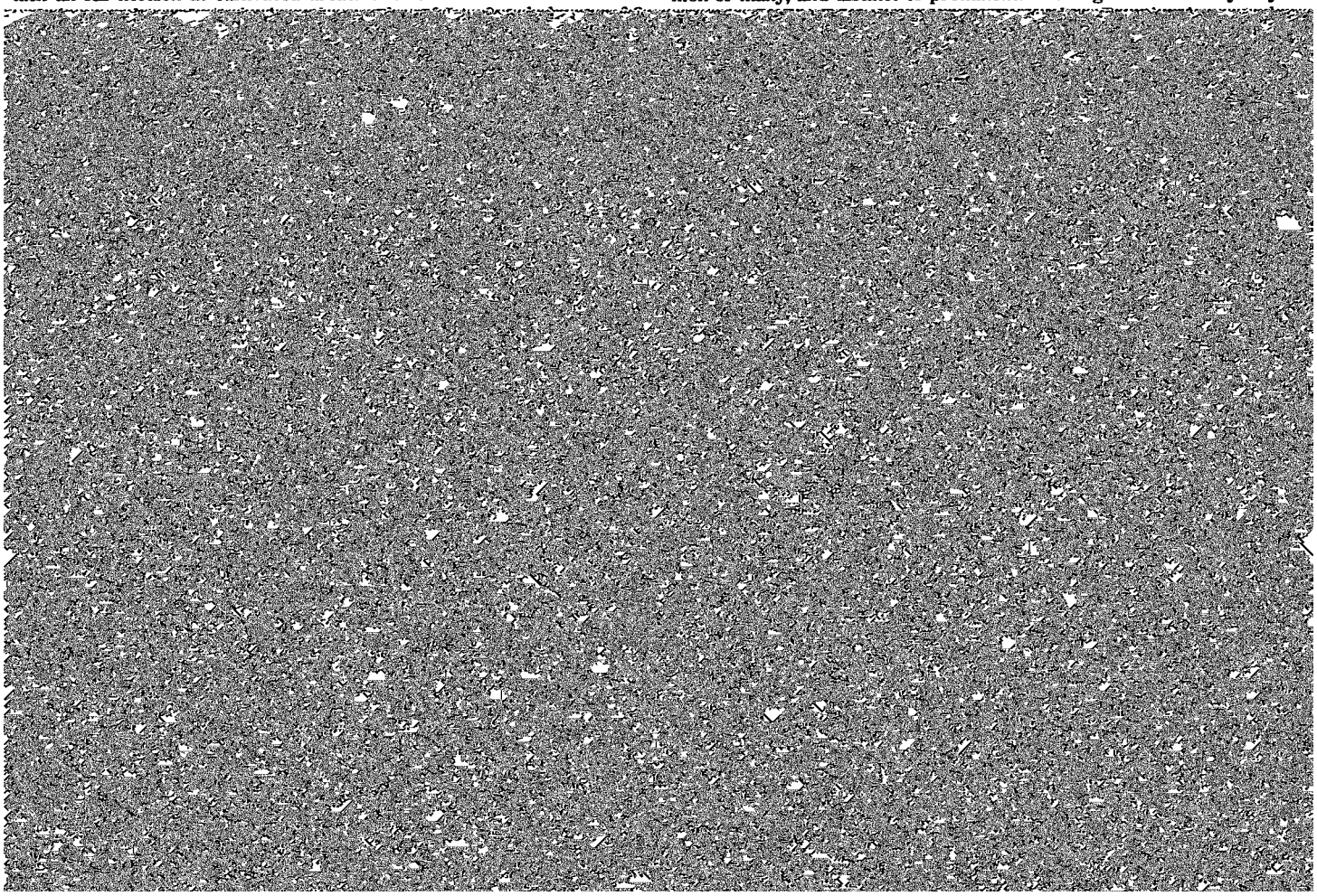
B23g—38 to 47 inches; olive gray (5Y 5/2) silty clay loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate coarse subangular blocky; firm; patchy thin olive gray (5Y 4/2) organic coatings on faces of peds and dark olive gray (5Y 3/2) organic matter in krotovina; neutral; clear smooth boundary.

B3g—47 to 53 inches; gray to light gray (5Y 6/1) silty clay loam; many coarse prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; neutral; clear smooth boundary.

Cg—53 to 60 inches; gray to light gray (5Y 6/1) silty clay loam; common medium distinct light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/8) mottles; massive; friable; neutral.

The solum thickness ranges from 36 to 60 inches. Thickness of the mollic epipedon ranges from 10 to 24 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The B1g horizon, where present, is light silty clay or heavy silty clay loam. The B2g horizon has values of 4 to 6 and chroma of 1 or 2. Mottles are common or many, and distinct or prominent. The B2g horizon is silty clay or



B22t—17 to 23 inches; brown (10YR 5/3) silty clay loam; common fine distinct light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common moderately thick dark grayish brown (10YR 4/2) clay films on faces of peds; few medium distinct dark accumulations (Fe and Mn oxides); medium acid; clear smooth boundary.

B23t—23 to 29 inches; brown (10YR 5/3) silty clay loam; common medi

The thickness of the mollic epipedon ranges from 24 to 42 inches. The A and B horizons have value of 2 or 3 and chroma of 1 or 2. They are dominantly loam, but the range includes silt loam, silty clay loam, and clay loam. The 10 to 40 inch control section is 18 to 35 percent clay. Any increase of clay in the B horizon is caused by stratification and not translocation. Reaction is mildly alkaline or moderately alkaline. The C horizon has a value of 3 through 7 and chroma of 1 or 2. It is mildly or moderately alkaline.

dark accumulations (Fe and Mn oxides); common shale fragments and limestone pebbles; strong effervescence; mildly alkaline.

The thickness of the solum and the depth to free carbonates range from 20 to 48 inches. The A horizon ranges from 8 to 13 inches in

The A horizon has value of 2 or 3 and chroma of 1 or 2. The B2t horizon has value of 4 or 5 and chroma of 2 to 4, and is distinctly mottled. Reaction is medium acid to mildly alkaline. The IIB3 horizon is silt loam, sandy loam, or loam. The IIC horizon has value of 5 or 6 and chroma of 1 or 2. It is moderately alkaline, stratified silt loam, sandy

Typical pedon of Otter silt loam, 570 feet north and 1,980 feet west of the southeast corner of sec. 9, T. 38 N., R. 7 E.

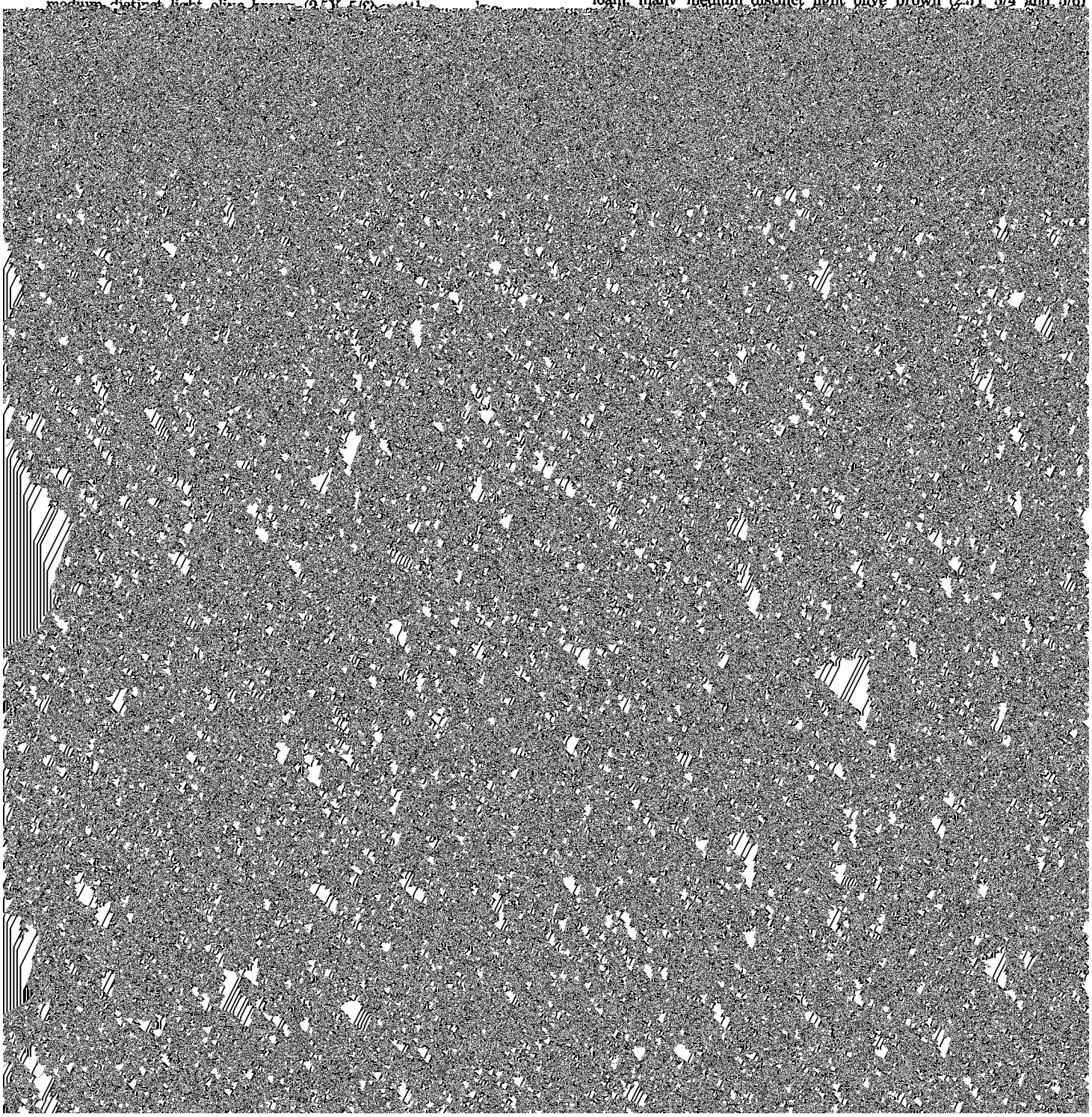
A11—0 to 18 inches; black (10YR 2/1) silt loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

A12—18 to 28 inches; black (10YR 2/1) silt loam; weak medium subangular blocky structure; friable; neutral; clear smooth boundary.

B2g—28 to 39 inches; dark grayish brown (2.5Y 4/2) silt loam; many medium distinct light olive brown (2.5Y 5/6) mottles; weak coarse prismatic structure parting to moderate coarse subangular blocky; firm; few dark accumulations (Fe and Mn oxides); neutral; clear smooth boundary.

B32g—45 to 53 inches; olive gray (5Y 4/2) and gray (5Y 5/1) silty clay loam; many medium distinct light olive brown (2.5Y 5/4 and 5/6) mottles; weak coarse subangular blocky structure; firm; common dark accumulations (Fe and Mn oxides); neutral; gradual smooth boundary.

Cg—53 to 60 inches; olive gray (5Y 5/2) and gray (5Y 5/1) silty clay loam; many medium distinct light olive brown (2.5Y 5/4 and 5/6)



IIB31—43 to 51 inches; dark yellowish brown (10YR 4/4) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; firm; continuous thin brown to dark brown (10YR 4/3) organic coatings on faces of peds; few dark accumulations (Fe and Mn oxides); slightly acid; clear smooth boundary.

IIC—48 to 60 inches; yellowish brown (10YR 5/4) stratified loam and silt loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/8) mottles; massive; mildly alkaline.

The thickness of the solum and depth to free carbonates range from 40 to 60 inches. Thickness of the mollic epipedon ranges from 10 to 16

Rodman series

The Rodman series consists of excessively drained soils that are moderately rapidly permeable in the solum and rapidly permeable in the underlying material. These soils are on kamic moraines and eskers and are shallow to sand and gravel. They formed in gravelly sand. Slopes range from 15 to 30 percent.

B1—11 to 18 inches; brown to dark brown (10YR 4/3) and dark yellowish brown (10YR 4/4) silty clay loam; weak very fine subangular blocky structure; friable; strongly acid; clear smooth boundary.

B21t—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; continuous thin brown to dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

B22t—24 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; continuous thin brown to dark brown (10YR 4/3) clay films on faces of peds;

B23t—23 to 32 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak coarse prismatic structure parting to moderate coarse subangular blocky; firm; common thin dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular dark accumulations (Fe and Mn oxides); slightly acid; clear smooth boundary.

B24t—32 to 45 inches; light olive brown (2.5Y 5/4) silty clay loam; many medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak coarse subangular blocky structure; firm; very fine thin dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular dark accumulations (Fe and Mn oxides); neutral; clear smooth boundary.

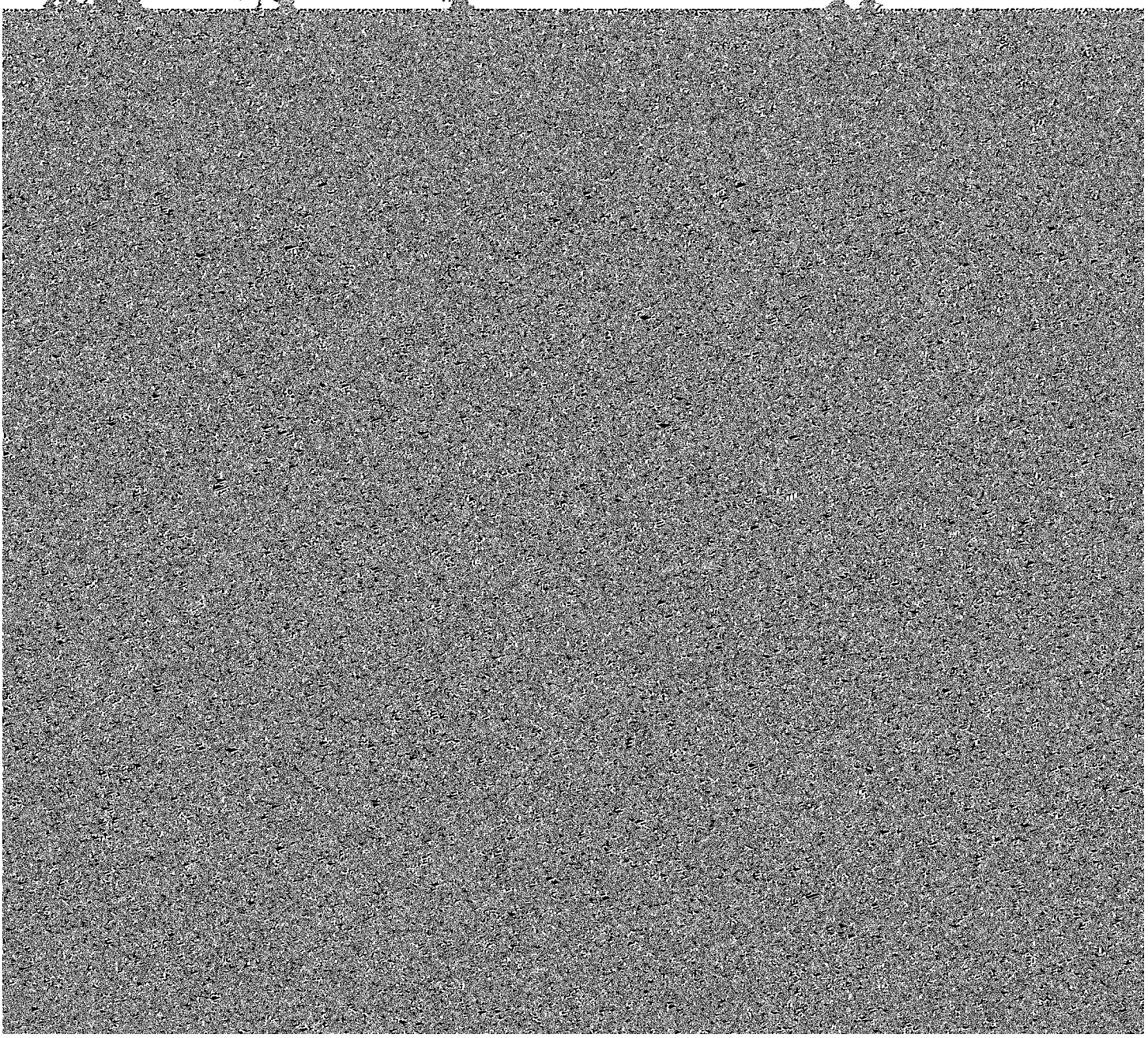
IIB3—45 to 55 inches; light olive brown (2.5Y 5/4) clay loam; many medium distinct light olive brown (2.5Y 5/6) and olive brown (2.5Y 6/8) mottles; weak coarse subangular blocky structure; firm; few medium irregular dark accumulations (Fe and Mn oxides); few dolomitic pebbles; neutral; gradual smooth boundary.

B23t—32 to 41 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; patchy thin brown to dark brown (10YR 4/3) clay films on faces of peds; few fine rounded dark accumulations (Fe and Mn oxides); strongly acid; abrupt smooth boundary.

IIB24t—41 to 48 inches; yellowish brown (10YR 5/4) sandy clay loam; moderate coarse subangular blocky structure; friable; few thin brown to dark brown (10YR 4/3) clay films on faces of peds; few fine rounded dark accumulations (Fe and Mn oxides); medium acid; clear smooth boundary.

IIB31—48 to 58 inches; mixed brown to dark brown (7.5YR 4/4) and yellowish brown (10YR 5/4) sandy clay loam; weak coarse subangular blocky structure; friable; very few fine rounded dark accumulations (Fe and Mn oxides); strongly acid; clear smooth boundary.

IIB32—58 to 65 inches; mixed brown to dark brown (7.5YR 4/4) and yellowish brown (10YR 5/4) sandy loam; very weak coarse subangular blocky structure; friable; strongly acid; clear smooth boundary.



IIB3—37 to 40 inches; yellowish brown (10YR 5/4) loam; few medium distinct yellowish red (5YR 5/8) mottles; weak coarse subangular blocky structure; friable; slight effervescence; mildly alkaline; gradual smooth boundary.

IIC—40 to 60 inches; yellowish brown (10YR 5/4) loam; massive; friable; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 24 to 40 inches. Thickness of the mollic epipedon ranges from 10 to 18 inches.

The A horizon has a value of 2 or 3 and chroma of 1 or 2. The B2t horizon has value of 4 or 5 and a chroma of 3 to 6. The part of the B horizon that formed in loess is silty clay loam, and the part that formed in till is clay loam, loam, or silt loam. The B2 horizon is 27 to 35 percent clay. Reaction is medium acid or slightly acid. The C horizon has value of 5 or 6 and chroma of 4 through 8. It is mildly alkaline or moderately alkaline.

Selma series

The Selma series consists of deep, poorly drained, moderately permeable soils on flats and in depressions on

sive; friable; common medium dark accumulations (Fe and Mn oxides); strong effervescence; moderately alkaline.

The solum ranges from 35 to 55 inches in thickness. Thickness of the mollic epipedon ranges from 12 to 20 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is dominantly loam, but includes clay loam. The B1g horizon is loam or clay loam. The B2g horizon has value of 4 to 6 and chroma of 1 or 2. It is clay loam that is 27 and 35 percent clay. Reaction is medium acid to mildly alkaline. The B3g horizon is loam, sandy loam, or sandy clay loam. The Cg horizon has value of 4 to 6 and chroma of 1 or 2. It is stratified silt loam, sand, loamy sand, or sandy loam. Reaction is moderately alkaline or mildly alkaline.

Thorp series

The Thorp series consists of deep, poorly drained, slowly permeable soils in depressions on outwash plains. These soils formed in calcareous, silty loess and the stratified, underlying loamy outwash. Slopes range from 0 to 2 percent.

of the horizon. Reaction is medium acid to neutral. The IIB3 horizon is sandy loam, sandy clay loam, silt loam, or clay loam. The IIC horizon has value of 4 to 6 and chroma of 1 to 4. It is mildly alkaline or moderately alkaline.

Warsaw series

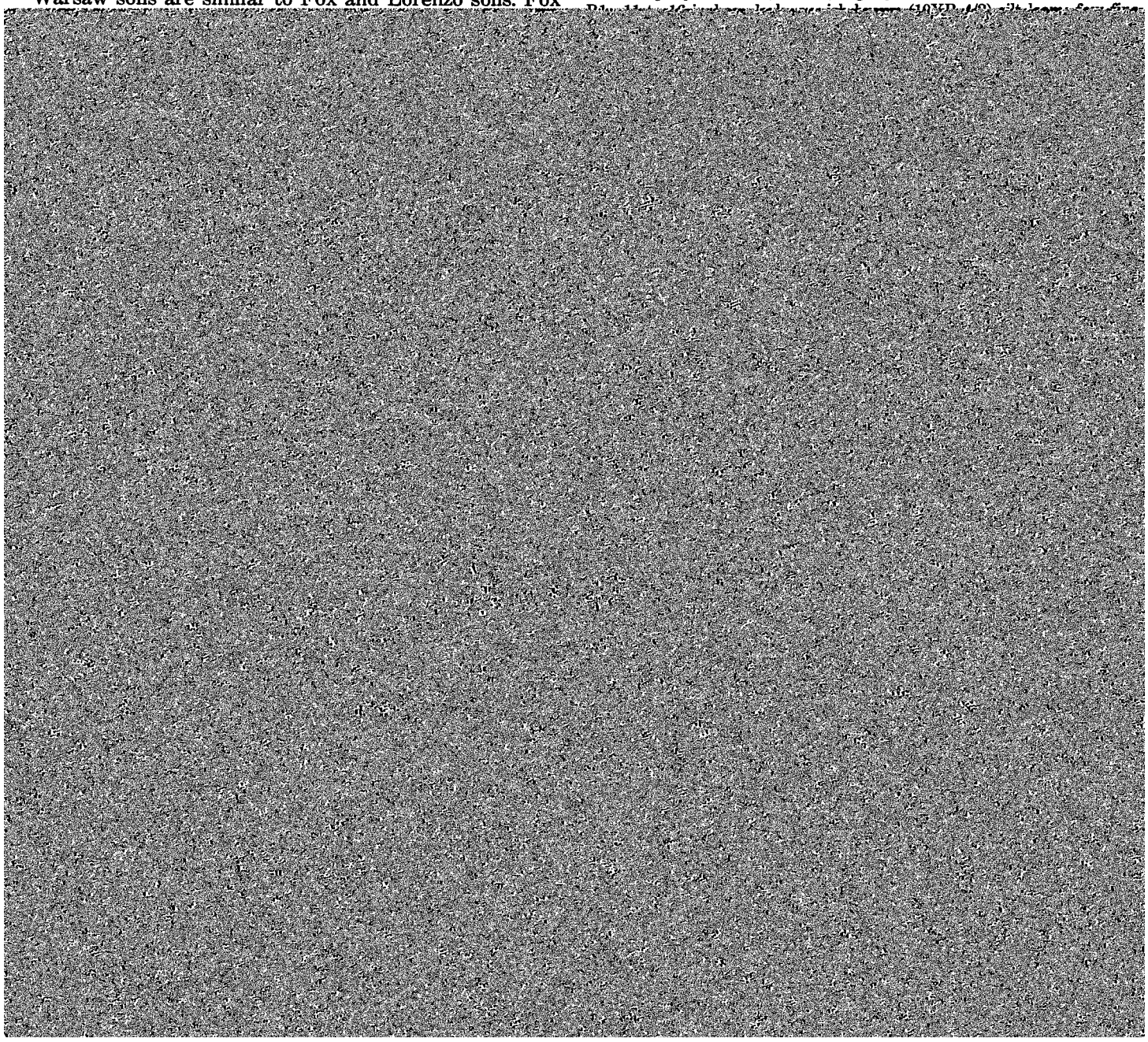
The Warsaw series consists of well drained soils on outwash plains and stream terraces. These soils are moderately permeable in the solum and rapidly permeable in the underlying material. They are moderately deep to sand and gravel and formed in loamy outwash and the underlying sand and gravel. Slopes range from 0 to 5 percent.

Warsaw soils are similar to Fox and Lorenzo soils. Fox join Drummer and Zurich soils on the landscape. Drummer soils are poorly drained, have a mollic epipedon, and are in drainageways at lower elevations than Wauconda soils. Zurich soils are well drained and moderately well drained, have a lighter colored horizon, and are at higher elevations than Wauconda soils.

Typical pedon of Wauconda silt loam, 580 feet south and 340 feet west of the northeast corner of sec. 12, T. 38 N., R. 8 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

A2—8 to 11 inches; dark grayish brown (10YR 4/2) silt loam; very weak thin platy structure; friable; slightly acid; clear smooth boundary.



elevations than Waupecan soils. Elburn soils are the solum and underlying material. Will soils commonly

B23t—21 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct brownish yellow (10YR 6/6) mottles; moderate coarse subangular blocky structure; firm; few thin brown to dark brown (10YR 4/3) clay films on faces of peds; neutral; abrupt smooth boundary.

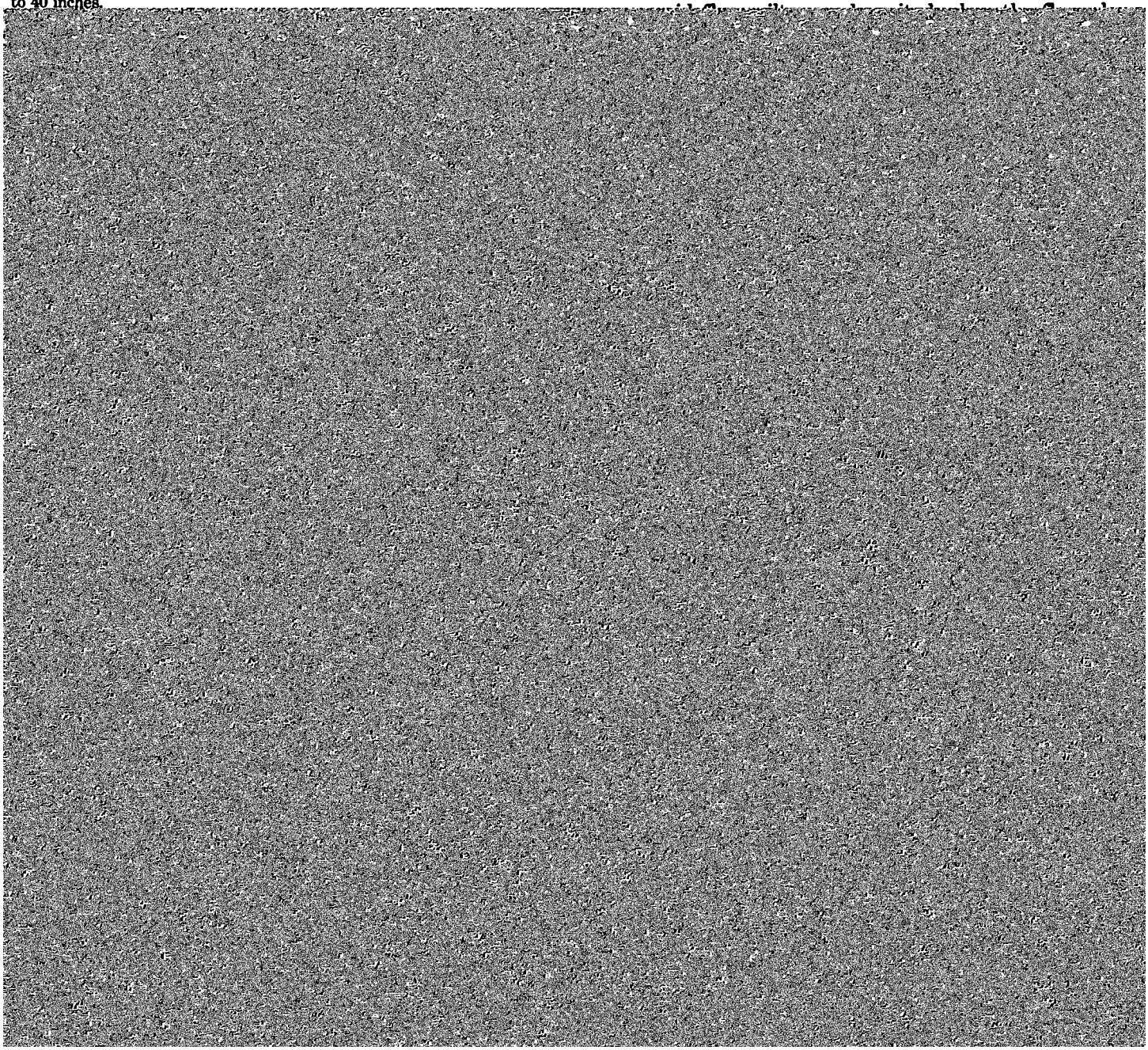
IIB3—28 to 31 inches; yellowish brown (10YR 5/4) silt loam and high amounts of sand; common medium distinct brownish yellow (10YR 6/6) and yellow (10YR 7/6) mottles; weak coarse subangular blocky structure; friable; slight effervescence; mildly alkaline; clear smooth boundary.

IIC—31 to 60 inches; light yellowish brown (10YR 6/4) stratified silt loam and fine sandy loam; many medium distinct light brownish gray (10YR 6/2) and brownish yellow (10YR 6/6) mottles; massive; friable; strong effervescence; moderately alkaline.

Thickness of the silty mantle ranges from 20 to 40 inches, and thickness of the solum and the depth to free carbonates range from 20 to 40 inches.

About 85 percent of the soils in Kane County formed partly in windblown silt called loess. The thickness of this loess mantle varies from several inches to 4 or 5 feet in the county, depending on the location with respect to the loess sources. Loess thickness is greatest in the southwestern part of the county. The Flanagan, Batavia, and Waupecan series are examples of soils that have 3 to 5 feet of loess overlying a contrasting parent material. Casco, Morley, and Miami soils on the other hand, have little or no loess in their profile.

About 41 percent of the soils formed partly or entirely in medium textured glacial outwash. This material generally consists of stratified layers of sands and silts deposited by melt water. Sands are deposited under a



are wet to the extent that only such water-adapted vegetation as sages, rushes, and cattails will survive. Remains of this vegetation accumulate rapidly and range in thickness from a few feet to as much as 70 feet. The Houghton and Lena soils formed in highly decomposed plant remains. Peat deposits are rare in the county, but

Temperature and precipitation control the rate of chemical and physical weathering of parent material. Alternate freezing and thawing break down minerals and rock fragments. Water percolating downward leaches carbonates and exchangable bases from the soil. The percolating water causes formation and movement of clay in

The most recent soil, Urban land-Loamy Orthents, is soil material that has been altered by man. Depending on the care man takes to stabilize this material, formation of soil horizons will take several hundred to several thousand years.

Thick sand and gravel outwash deposits and the light yellowish brown or gray Yorkville till lie beneath the Haeger till. This till is dominant in the southwest part of Kane County.

The Yorkville Till Member is gray or light yellowish

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	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	More than 9

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

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

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

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents

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 40 or 80 inches (1 or 2 meters).

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

Cutbanks cave. Unstable walls of cuts made by earthmoving equipment. The soil sloughs easily.

Depth to rock. Bedrock at a depth that adversely affects 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 [illegible]

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

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

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

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake. The rapid movement of water into the soil.

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

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

A horizon.—The mineral horizon, formed or forming at or near the

Mottling, soil. Irregular spots of different colors that vary in number

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

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

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

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.

Saprolite (geology). Soft, earthy, clay-rich, thoroughly decomposed rock formed in place by chemical weathering of igneous and metamorphic rock. In soil survey, the term saprolite is applied to any unconsolidated residual material underlying the soil and grading to hard bedrock below.

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

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

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

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

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

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake. The slow movement of water into the soil.

Slow refill. The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

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

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and [illegible] *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature 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 other plant and animal life characteristics of the soil are largely confined to the solum.

Stone line. A concentration of coarse fragments in soils that generally marks an old weathering surface. In a cross section, the line may be one fragment or more thick. The line generally overlies material that weathered in place and marks the top of a paleosol. It is ordinarily overlain by recent sediment of variable thickness.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

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

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

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

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

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

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

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that 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.

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

Thin layer. Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

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

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is [illegible]

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

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 a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Illustrations

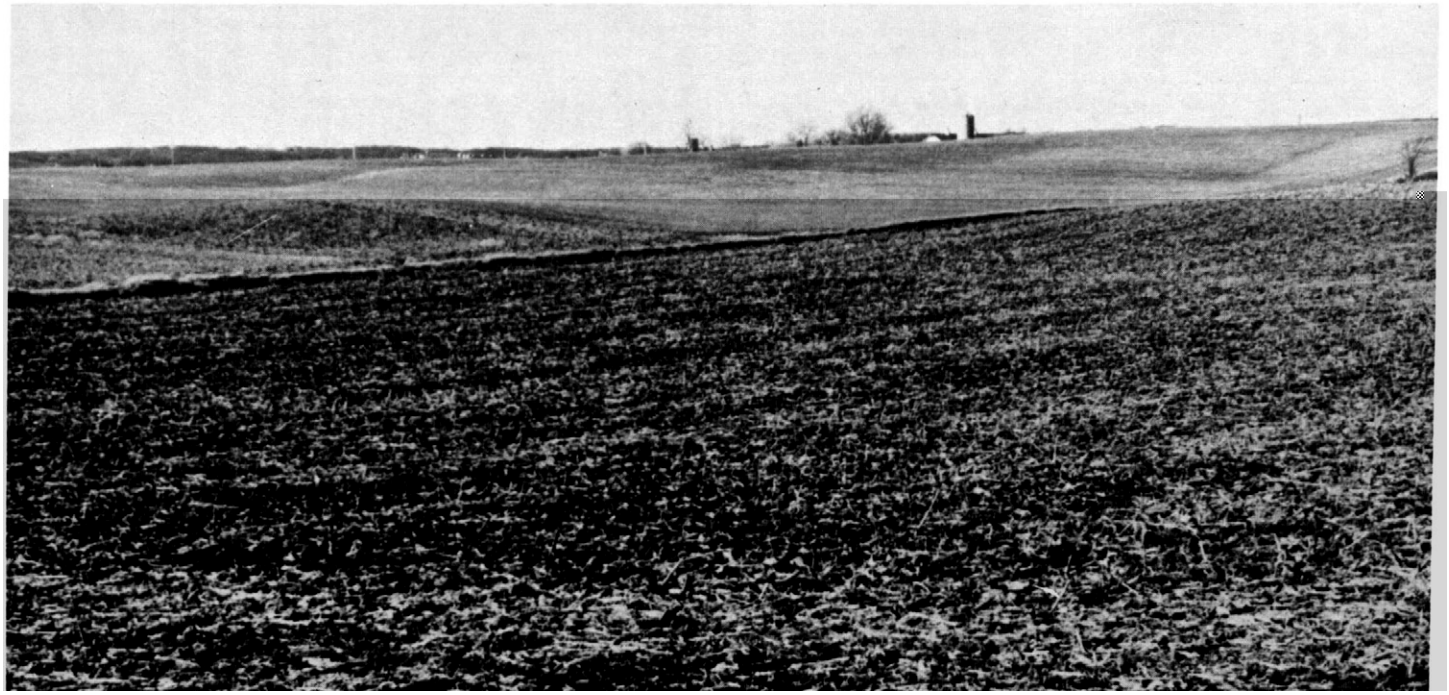


Figure 3.—Typical Drummer-Saybrook-Catlin landscape. Drummer soils are in foreground, Saybrook soils are on ridges and side slopes in background, and Catlin soils are on side slopes at right.

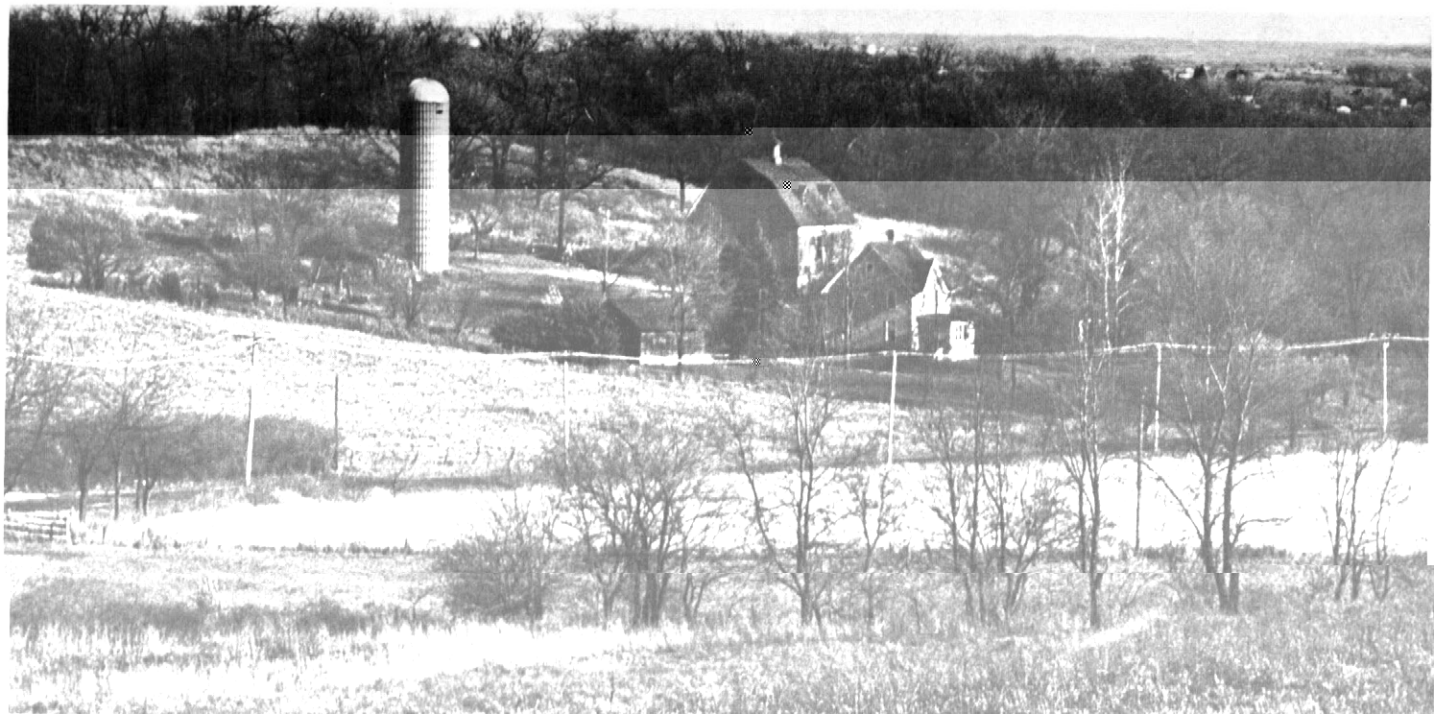


Figure 4.—Typical Miami-Octagon landscape. Miami and Casco soils are on ridges at left, and Octagon soils are in foreground.

Figure 5.—Landscape in Dodge-Birkbeck-Camden map unit. Dodge and Camden soils are on ridges in background; Birkbeck soils are in foreground.

Figure 6.—Landscape in Drummer-Harvard map unit. The dark Drummer soils are in low areas, and Harvard soils are on adjacent ridges and knolls.

Figure 7.—Landscape in Milford-Varna-Markham map unit. Milford soils are in foreground and waterway; Varna and Markham soils are on ridges in background.

Figure 8.—Home on flood plain of Otter silt loam along Mill Creek.

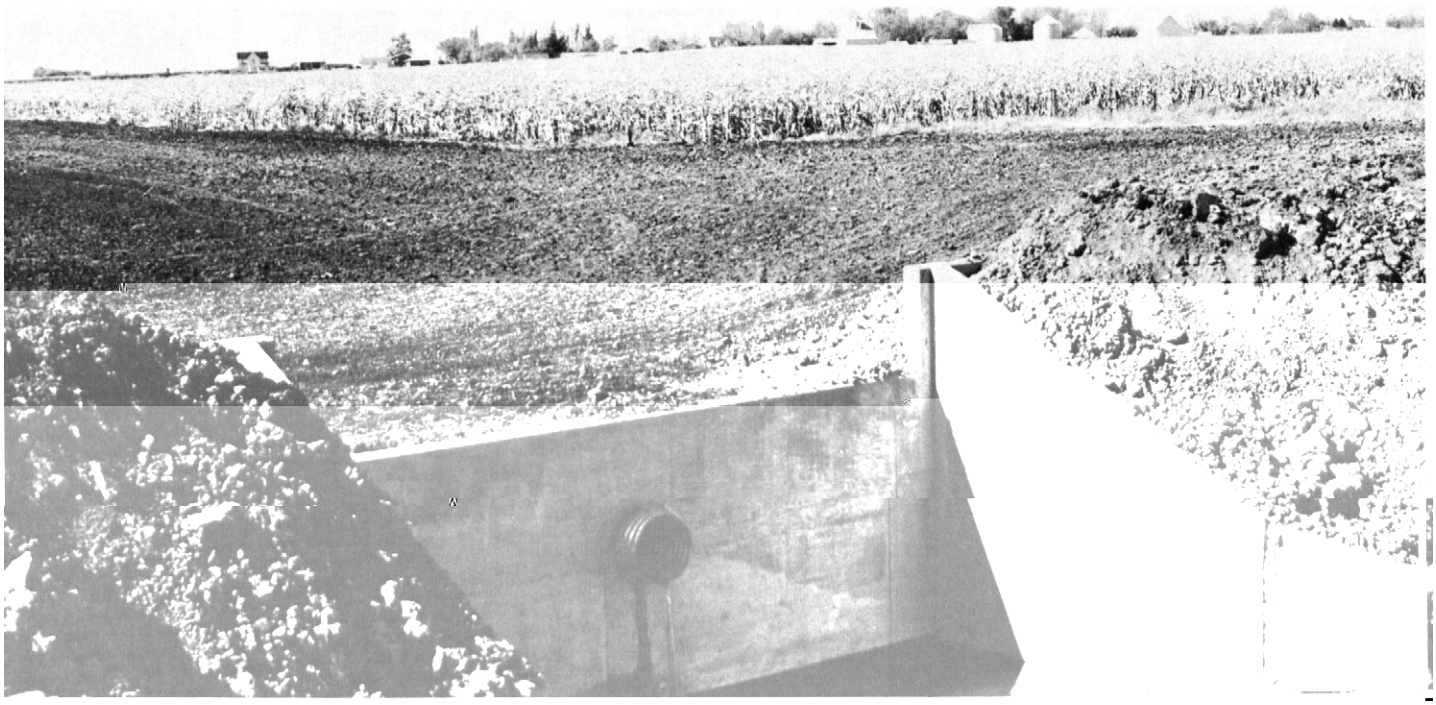


Figure 9.—Concrete straight-drop spillway at the end of a waterway on Drummer silty clay loam.

Figure 10.—Conical mounds, or kames, are distinctive in Kane County. Soil is Casco loam, 15 to 20 percent slopes.

Figure 11.—Forested kame in background is Miami-Casco complex, 10 to 20 percent slopes. This forest preserve has multiple recreation uses.

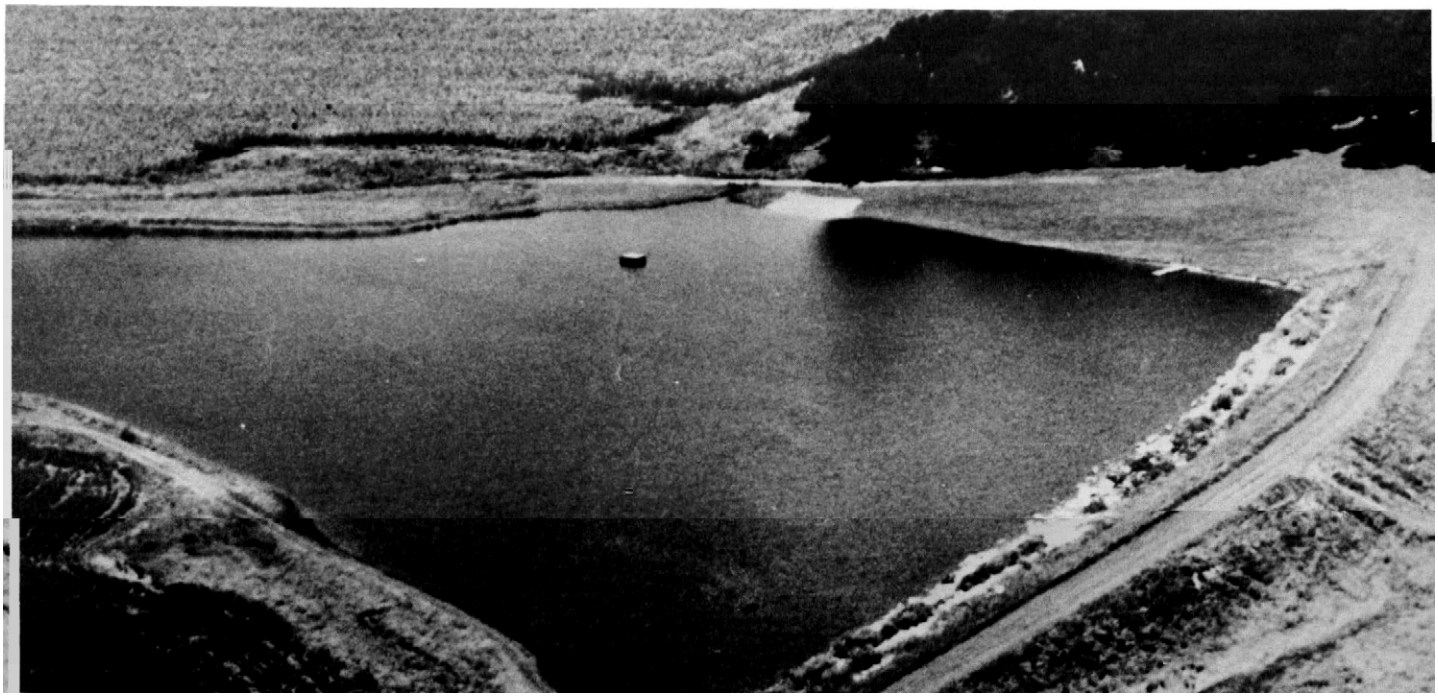
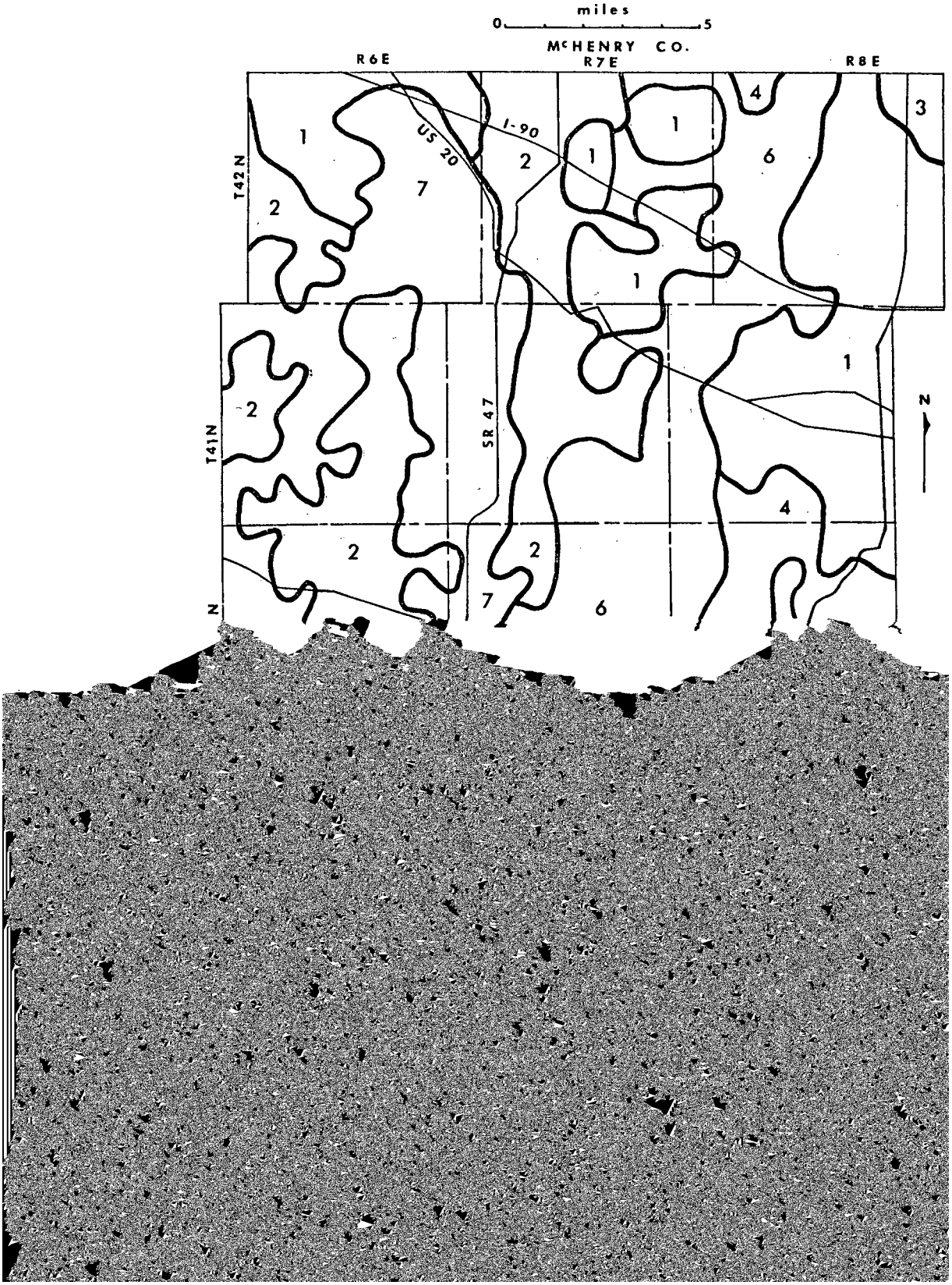


Figure 12.—Farm embankment pond on Drummer silty clay loam is useful for erosion control, recreation, and water for livestock.


miles
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R8E
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T41N
US 20
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Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

[Recorded in the period 1951-73 at Aurora, Ill.]

	Temperature	Precipitation

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-73 at Aurora, Ill.]

Probability	Temperature--		
	24° F or lower	28° F or lower	32° F or lower

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
24B	Dodge silt loam, 2 to 5 percent slopes	9,539	2.9
24C2	Dodge silt loam, 5 to 10 percent slopes, eroded	2,234	0.7
27B	Miami silt loam, 2 to 5 percent slopes	6,284	1.9
27C2	Miami silt loam, 5 to 10 percent slopes, eroded	7,892	2.4
27D2	Miami silt loam, 10 to 15 percent slopes, eroded	3,605	1.1
27D3	Miami clay loam, 10 to 15 percent slopes, severely eroded	503	0.2
59	Lisbon silt loam	2,840	0.9
60C2	La Rose loam, 5 to 10 percent slopes, eroded	548	0.2
60D2	La Rose loam, 10 to 15 percent slopes, eroded	383	0.1
62	Herbert silt loam	2,526	0.8
67	Harpster silty clay loam	3,696	1.1
69	Milford silty clay loam	9,625	2.9
76	Otter silt loam	3,436	1.0
82	Millington loam	2,069	0.6
93F	Rodman soils, 15 to 30 percent slopes	2,064	0.6
103	Houghton muck	6,825	2.1
104	Virgil silt loam	3,257	1.0
105A	Batavia silt loam, 0 to 2 percent slopes	1,690	0.5
105B	Batavia silt loam, 2 to 5 percent slopes	1,727	0.5
125	Selma loam	1,649	0.5
134A	Camden silt loam, 0 to 2 percent slopes	907	0.3
134B	Camden silt loam, 2 to 5 percent slopes	4,831	1.5
134C2	Camden silt loam, 5 to 10 percent slopes, eroded	1,422	0.4
145A	Saybrook silt loam, 0 to 2 percent slopes	1,028	0.3
145B	Saybrook silt loam, 2 to 5 percent slopes	13,935	4.2
145C2	Saybrook silt loam, 5 to 10 percent slopes, eroded	1,605	0.5
146	Elliott silt loam	3,842	1.2
148A	Proctor silt loam, 0 to 2 percent slopes	2,472	0.7
148B	Proctor silt loam, 2 to 5 percent slopes	4,095	1.2
149	Brenton silt loam	7,660	2.3
152	Drummer silty clay loam	67,548	20.3
154	Flanagan silt loam	3,978	1.2
171A	Catlin silt loam, 0 to 2 percent slopes	1,786	0.5

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

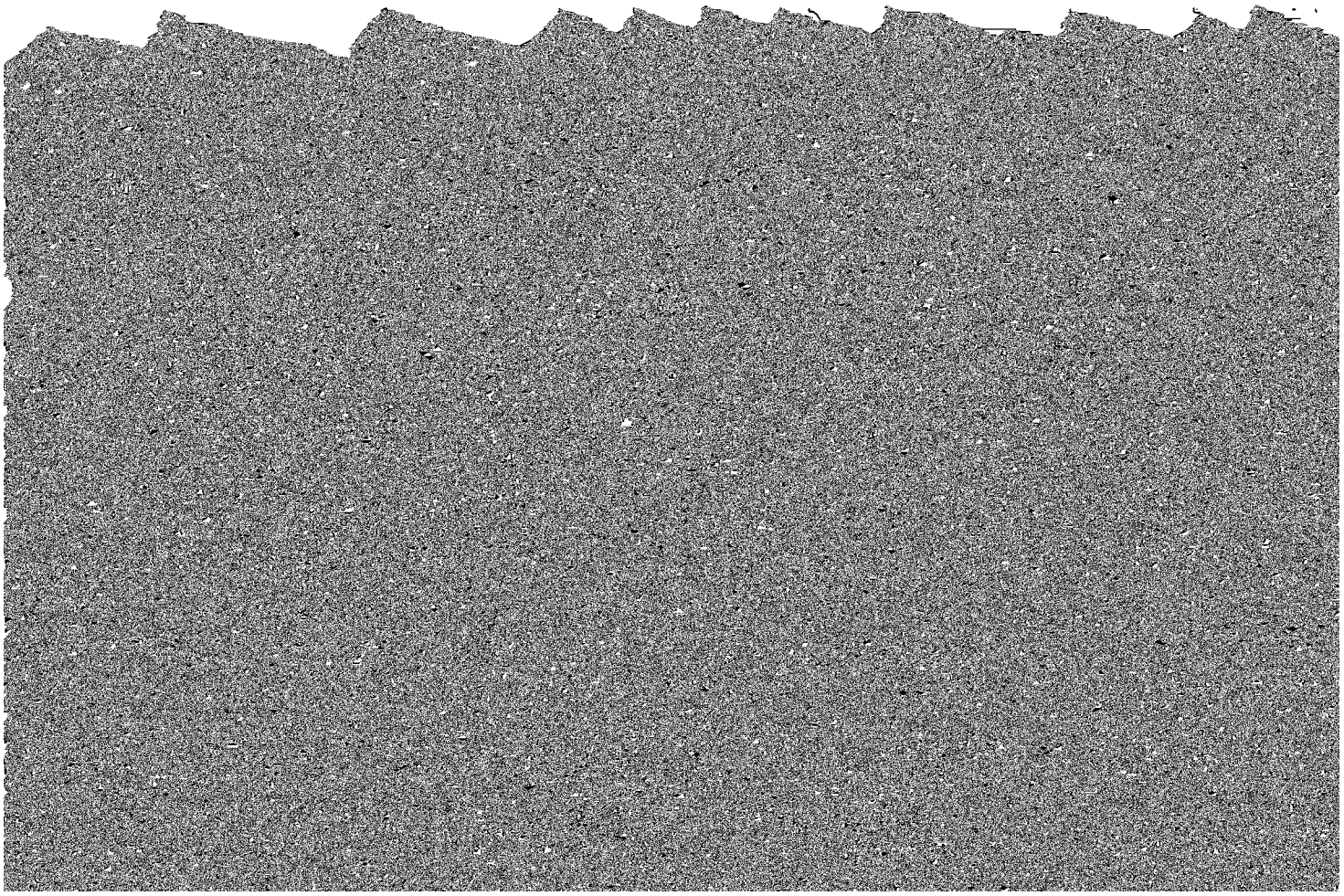

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1976. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
24B---------- Dodge	105	38	---	75	4.5	---
24C2---------- Dodge	95	35	---	60	4.0	---
27B---------- Miami	101	35	42	59	4.2	---
27C2---------- Miami	95	33	38	50	3.8	---
27D2---------- Miami	85	28	36	---	2.6	---
27D3---------- Miami	---	---	---	---	2.5	---
59----------	130	46	55	84	5.4	9.0

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*
134B---------- Camden	110	38	48	65	5.0	8.3
134C2---------- Camden	100	35	40	55	4.5	7.0
145A---------- Saybrook	121	42	52	76	5.1	8.5
145B---------- Saybrook	119	41	51	75	5.0	8.4
145C2---------- Saybrook	111	38	46	68	4.6	7.7
146---------- Elliott	110	38	47	72	4.6	7.2
148A---------- Proctor	125	40	51	80	5.0	8.3
148B---------- Proctor	123	45	51	80	4.9	8.2
149---------- Brenton	139	48	---	83	5.4	8.5
152---------- Drummer	135	45	53	75	5.0	8.2
154---------- Flanagan	141	47	58	84	5.5	9.1
171A, 171B---------- Catlin	128	41	53	79	5.3	8.8
194B---------- Morley	90	33	41	60	3.6	6.2
194C---------- Morley	82	28	36	54	3.4	5.9
194D---------- Morley	77	25	33	51	3.2	5.4
194E---------- Morley	72	---	30	48	3.0	5.0
198---------- Elburn	140	48	55	85	5.5	9.1
199A---------- Plano	135	48	55	80	5.5	8.5
199B---------- Plano	130	45	52	76	5.2	8.0
206---------- Thorp	110	38	44	63	4.2	7.0
210---------- Lena	109	37	---	---	---	---
219---------- Millbrook	125	45	51	74	4.9	8.0
223B---------- Varna	101	37	46	66	4.3	6.8

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*
223C2 Varna	90	30	37	55	3.8	6.1
233A Birkbeck	107	37	48	64	4.5	7.5
233B Birkbeck	106	37	48	64	4.5	7.5
233C2 Birkbeck	99	33	44	58	4.0	6.8
236 Sabina	116	38	49	68	4.7	7.8
243A St. Charles	115	40	50	70	4.8	8.0
243B St. Charles	112	38	47	66	4.6	8.0
290A Warsaw	100	35	50	68	3.3	---
290B Warsaw	95	35	46	65	3.3	---
298 Beecher	101	35	44	65	4.1	6.6
318A Lorenzo	80	27	38	55	3.3	5.5
318B Lorenzo	78	26	36	53	3.2	5.3
318C2 Lorenzo	72	22	31	49	3.0	5.0
323D, 323E Casco	---	---	---	40	2.0	---
325A Dresden	96	33	---	63	4.1	6.8
325B Dresden	93	30	---	60	4.0	6.6
325C Dresden	88	28	---	55	3.8	6.1
327A Fox	90	32	45	75	3.0	---
327B Fox	85	30	42	70	3.0	---
327C Fox	80	28	38	65	2.5	---
327D Fox	75	25	32	60	2.5	---
329 Will	105	38	45	66	4.5	---
330 Peotone	107	38	37	53	3.8	---

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*
343 Kane	106	39	48	69	4.4	7.2
344A Harvard	115	37	47	71	4.7	7.8
344B Harvard	110	35	44	67	4.5	7.4
344C Harvard	105	33	41	63	4.3	7.0
347 Canisteo	110	36	---	75	3.5	5.2
361B Kidder	115	37	47	80	4.5	---
361C Kidder	100	30	32	52	3.2	---
361D Kidder	85	---	---	70	3.5	---
369A Waupecan	130	45	---	75	5.0	---
369B Waupecan	115	40	48	68	4.5	---
392. Urban land						
442 Mundelein	123	40	50	79	5.0	8.0
531B Markham	93	35	43	63	4.1	6.6
531C2 Markham	85	29	35	56	3.7	6.0
570B Martinsville	120	42	48	---	4.0	---
570C Martinsville	110	38	44	---	3.6	---
656B Octagon	115	40	52	---	3.8	---
656C2 Octagon	100	35	45	---	3.3	---
656D2 Octagon	95	33	43	---	3.1	---
696B Zurich	102	33	43	63	4.3	7.1
697 Wauconda	112	37	47	73	4.7	---
791A Rush	125	44	50	---	4.1	---
791B	125	44	50	---	4.1	---

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*
791C2 Rush	120	42	48	---	4.0	---
792A Bowes	130	45	54	73	5.2	8.6
792B Bowes	120	40	50	70	5.0	8.3
792C Bowes	114	38	47	66	4.7	7.9
864**, 865**. Pits						
921B Faxon	85	---	---	67	3.2	---
938C. Miami						
938E Miami	---	---	---	---	2.4	---
1103. Houghton						

* 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 a period of 30 days.
** See map unit description for the composition and behavior of the map unit.

TABLE 6.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; the symbol > means greater than. Absence of an entry means that trees of the height class do not normally grow on this soil]

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
24B, 24C2 Dodge	---	Northern white-cedar, lilac, common ninebark, silky dogwood.	White spruce, Norway spruce.	Eastern white pine, red pine.	---
27B, 27C2, 27D2, 27D3 Miami	Silky dogwood	Late lilac, Persian lilac, autumn-olive, Tatarian honeysuckle, Amur privet.	Red pine, white spruce.	Eastern white pine, Norway spruce.	Green ash.
59 Lisbon	Gray dogwood	Autumn-olive, silky dogwood.	Amur maple, Russian-olive, Amur honeysuckle.	Norway spruce	Eastern white pine, Douglas-fir.
60C2, 60D2 La Rose	Gray dogwood	Autumn-olive, Amur honeysuckle.	Amur maple	Norway spruce, Douglas-fir, eastern white pine, red pine.	---
62 Herbert	---	Amur maple, silky dogwood, Russian-olive.	---	Douglas-fir, eastern white pine.	Norway spruce, white spruce.
67 Harpster	---	Silky dogwood, Amur maple, American cranberrybush.	Russian-olive, flowering dogwood.	Tamarack, green ash, black spruce.	---
69 Milford	Gray dogwood	Silky dogwood, forsythia, redosier dogwood, northern white-cedar, Amur honeysuckle.	Black spruce, Amur maple, tall purple willow, medium purple willow.	---	Eastern cottonwood, Lombardy poplar.
76 Otter	---	Redosier dogwood, northern white-cedar, nannyberry viburnum.	Green ash, white spruce.	Eastern white pine, jack pine, silver maple.	---
82 Millington	---	Silky dogwood, American cranberrybush.	Amur maple	---	Eastern cottonwood, black spruce, European larch.
93F* Rodman	Vanhoutte spirea	Autumn-olive, Tatarian honeysuckle, Amur honeysuckle, late lilac.	Red pine, eastern redcedar.	Eastern white pine, red pine, jack pine, Austrian pine.	---
103 Houghton	---	Silky dogwood, Vanhoutte spirea.	Laurel willow, Austrian pine.	Northern white-cedar, eastern white pine, Norway spruce.	Carolina poplar.
104 Virgil	---	Northern white-cedar, redosier dogwood, nannyberry viburnum.	White spruce, green ash.	Eastern white pine, silver maple, jack pine.	---

See footnote at end of table.

TABLE 6.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
105A, 105B Batavia	American cranberrybush.	Silky dogwood, autumn-olive.	Amur maple	Norway spruce	Douglas-fir, eastern white pine, red pine.
125 Selma	---	Amur maple, silky dogwood, American cranberrybush.	Flowering dogwood	Black spruce	Green ash, tamarack.
134A, 134B, 134C2 Camden	---	Autumn-olive, Amur honeysuckle, blackhaw, American cranberrybush, shadblow serviceberry.	Eastern hemlock	Norway spruce	Eastern white pine, red pine, Douglas-fir, honeylocust, blackgum.
145A, 145B, 145C2 Saybrook	Gray dogwood	Autumn-olive, forsythia.	Amur maple	Norway spruce, Douglas-fir, eastern white pine, red pine.	---
146 Elliott	---	Silky dogwood, autumn-olive, Amur honeysuckle.	Russian-olive	Red pine, Norway spruce, white spruce.	Eastern white pine.
148A, 148B Proctor	Russian-olive	Autumn-olive, silky dogwood, Amur honeysuckle.	Amur maple	Norway spruce, red pine.	Douglas-fir, eastern white pine.
149 Brenton	Silky dogwood	Amur honeysuckle, autumn-olive, late lilac.	---	Red pine	Norway spruce, eastern white pine, white spruce.
152 Drummer	Gray dogwood, dwarf purple willow.	Silky dogwood, Amur honeysuckle, redosier dogwood.	Northern white-cedar, tall purple willow, medium purple willow.	---	Lombardy poplar.
154 Flanagan	Mockorange	European burningbush, late lilac, shadblow serviceberry, autumn-olive, Amur honeysuckle, blackhaw, American cranberrybush.	Eastern hemlock	---	Eastern white pine, Norway spruce, honeylocust.
171A, 171B Catlin	---	Amur maple, silky dogwood, Amur honeysuckle.	Autumn-olive, Russian-olive.	Douglas-fir, eastern white pine, red pine.	Norway spruce.
194B, 194C, 194D, 194E Morley	Mockorange	Amur honeysuckle, autumn-olive, late lilac, blackhaw, American cranberrybush.	Eastern redcedar	Eastern white pine, Norway spruce, red pine, Douglas-fir, eastern hemlock.	---
198 Elburn	Silky dogwood	Autumn-olive	Amur maple, Russian-olive.	Norway spruce	Eastern white pine, Douglas-fir.
199A, 199B Plano	Gray dogwood	Autumn-olive, Amur honeysuckle.	---	Eastern white pine, red pine, Norway spruce, Douglas-fir.	---

See footnote at end of table.

TABLE 6.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
206 Thorp	---	Silky dogwood, flowering dogwood, American cranberrybush.	Green ash, Amur maple.	---	Eastern cottonwood, American sycamore.
210 Lena	---	Silky dogwood, Amur maple.	---	Black spruce	Tamarack.
219 Millbrook	Silky dogwood	Autumn-olive, Amur honeysuckle.	Amur maple	Red pine	Eastern white pine, Norway spruce, white spruce.
223B, 223C2	Gray dogwood	Autumn-olive, Amur	Northern white	Eastern white	

TABLE 6.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
329 Will	---	Silky dogwood, American cranberrybush.	Green ash, Amur maple, flowering dogwood.	Black spruce, tamarack.	---
330 Peotone	Gray dogwood	Forsythia, Amur maple.	Black spruce	Tamarack	Green ash.
343 Kane	---	Amur maple, autumn-olive, silky dogwood, Amur honeysuckle, late lilac.	---	Eastern white pine, Norway spruce, Douglas-fir.	---
344A, 344B, 344C Harvard	Gray dogwood	Autumn-olive, forsythia.	Amur maple	Norway spruce	Douglas-fir, eastern white pine, red pine.
347. Canisteo					
361B, 361C, 361D Kidder	---	Northern white-cedar, lilac, common ninebark, silky dogwood.	White spruce, Norway spruce.	Eastern white pine, red pine.	---
369A, 369B Waupecan	Silky dogwood, gray dogwood.	Forsythia, autumn-olive, late lilac, American cranberrybush.	Amur maple	Russian-olive	Eastern white pine, red pine, Douglas-fir, Norway spruce.
392*: Urban land.					
Orthents.					
442 Mundelein	---	Autumn-olive, Amur honeysuckle, lilac.	Russian-olive	Norway spruce, red pine.	Eastern white pine, Douglas-fir.
531B, 531C2 Markham	Gray dogwood	Autumn-olive, Amur honeysuckle, late lilac, American cranberrybush, blackhaw.	Northern white-cedar, eastern hemlock.	Eastern white pine, Norway spruce, red pine.	Honeylocust.
570B, 570C Martinsville	Mockorange	European burningbush, blackhaw, late lilac, Amur honeysuckle, shadblow service-berry, American cranberrybush, autumn-olive.	Eastern hemlock	Norway spruce	Eastern white pine, honeylocust.
656B, 656C2, 656D2 Octagon	Mockorange	European burningbush, blackhaw, late lilac, Amur honeysuckle, shadblow service-berry, American cranberrybush, autumn-olive.	Eastern hemlock	Norway spruce	Honeylocust, eastern white pine.

See footnote at end of table.

TABLE 6.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
696B Zurich	---	Silky dogwood, American cranberrybush, Amur honeysuckle, lilac.	Autumn-olive, Amur maple, Russian-olive.	Eastern white pine, red pine, Norway spruce, white spruce, Douglas-fir.	---
697 Wauconda	---	Common ninebark, lilac, Amur honeysuckle.	Norway spruce, white spruce, northern white-cedar, Amur maple.	Red pine, eastern white pine, common hackberry, green ash.	---
791A, 791B, 791C2 Rush	Mockorange	European burningbush, blackhaw, late lilac, Amur honeysuckle, shadblow serviceberry, American cranberrybush, autumn-olive.	Eastern hemlock	Norway spruce, honeylocust.	Eastern white pine.
792A, 792B, 792C Bowes	---	Autumn-olive, silky dogwood, Amur honeysuckle.	Amur maple	Norway spruce	Douglas-fir, eastern white pine, red pine.
864*, 865*. Pits					
921B*:					
Faxon	---	Tall purple willow, Tatarian honeysuckle, Siberian peashrub, redosier dogwood.	Russian-olive	---	Eastern cottonwood, golden willow.
Ripon	---	Northern white-cedar, lilac, common ninebark, silky dogwood.	White spruce, Norway spruce.	Eastern white pine, red pine.	---
938C*, 938E*:					
Miami	---	Blackhaw, late lilac, Amur honeysuckle, shadblow serviceberry, winged euonymus, American cranberrybush, autumn-olive.	Eastern hemlock, European burningbush.	Norway spruce	Eastern white pine, honeylocust.
Casco	American hazel, European privet.	Tamarisk, late lilac, forsythia, autumn-olive.	Austrian pine	Eastern white pine, red pine, jack pine.	---
1103 Houghton	Gray dogwood, dwarf purple willow.	Amur honeysuckle, redosier dogwood, silky dogwood.	Northern white-cedar, tall purple willow, medium purple willow.	---	Lombardy poplar.

* See map unit description for the composition and behavior of the map unit.

TABLE 7.--BUILDING SITE DEVELOPMENT

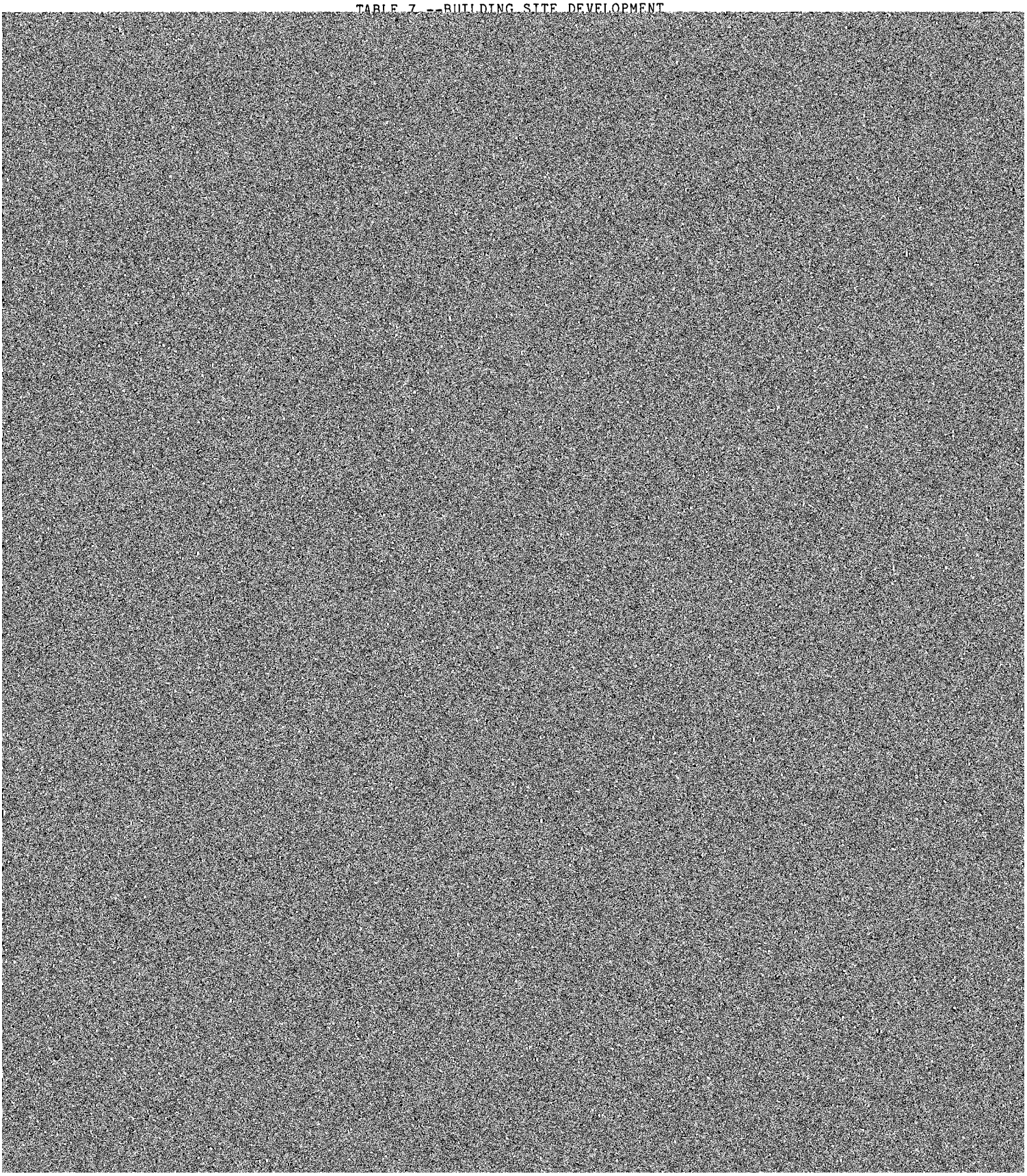

TABLE 7.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
93F*---------- Rodman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
103---------- Houghton	Severe: wetness, floods, excess humus.	Severe: wetness, floods, low strength.	Severe: wetness, low strength, floods.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: excess humus, wetness, floods.
104---------- Virgil	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
105A, 105B-------- Batavia	Moderate: wetness.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
125---------- Selma	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, frost action, floods.	Severe: wetness.
134A, 134B-------- Camden	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
134C2---------- Camden	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, slope, low strength.	Severe: frost action, low strength.	Slight.
145A, 145B-------- Saybrook	Moderate: wetness.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
145C2---------- Saybrook	Moderate: wetness.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, wetness.	Moderate: slope, shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
146---------- Elliott	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: frost action, low strength.	Moderate: wetness.
148A, 148B-------- Proctor	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
149---------- Brenton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
152---------- Drummer	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods, low strength.	Severe: wetness.
154---------- Flanagan	Severe: wetness.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, shrink-swell, low strength.	Severe: shrink-swell, wetness.	Severe: frost action, shrink-swell, low strength.	Moderate: wetness.
171A, 171B-------- Catlin	Moderate: wetness.	Moderate: low strength, shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: low strength, shrink-swell.	Severe: frost action, low strength.	Slight.
194B---------- Morley	Moderate: too clayey, wetness.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, low strength.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 7.--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
194C---------- Morley	Moderate: too clayey, wetness.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, low strength, slope.	Severe: low strength.	Slight.
194D---------- Morley	Moderate: too clayey, slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope, shrink-swell, wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
194E---------- Morley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
198---------- Elburn	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
199A, 199B-------- Plano	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
206---------- Thorp	Severe: wetness, floods, cutbanks cave.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, wetness.	Severe: wetness, floods, low strength.	Severe: wetness.
210---------- Lena	Severe: wetness, floods, excess humus.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: excess humus, wetness, floods.
219---------- Millbrook	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness, low strength.	Moderate: wetness.
223B---------- Varna	Slight---------	Moderate: shrink-swell, low strength.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, low strength.	Severe: low strength, frost action.	Slight.
223C2---------- Varna	Slight---------	Moderate: shrink-swell, low strength.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, low strength, slope.	Severe: low strength, frost action.	Slight.
233A, 233B-------- Birkbeck	Moderate: wetness.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
233C2----------	Moderate:	Moderate:	Moderate:	Moderate:	Severe:	Slight.

TABLE 7.--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

TABLE 7.--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
361D---------- Kidder	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
369A, 369B-------- Waupecan	Severe: cutbanks cave.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: low strength, frost action.	Slight.
392*:						
Urban land.						
Orthents.						
442---------- Mundelein	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
531B---------- Markham	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
531C2---------- Markham	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, low strength, slope.	Severe: frost action, low strength.	Slight.
570B---------- Martinsville	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: low strength.	Slight.
570C---------- Martinsville	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Severe: low strength.	Slight.
656B---------- Octagon	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: low strength.	Slight.
656C2---------- Octagon	Slight---------	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Severe: low strength.	Slight.
656D2---------- Octagon	Moderate: slope.	Moderate: slope, shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Severe: slope.	Severe: low strength.	Moderate: slope.
696B---------- Zurich	Moderate: wetness.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.
697---------- Wauconda	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Moderate: wetness.
791A, 791B, 791C2- Rush	Severe: cutbanks cave.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: frost action, low strength.	Slight.
792A, 792B-------- Bowes	Severe: cutbanks cave.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: frost action, low strength.	Slight.

See footnote at end of table.

TABLE 7.--BUILDING SITE DEVELOPMENT--Continued

[illegible]

TABLE 8.--SANITARY FACILITIES

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas
24B Dodge	Slight	Moderate: slope, seepage.
24C2 Dodge	Slight	Severe: slope.
27B Miami	Moderate: percs slowly.	Moderate: seepage, slope.
27C2, 27D2, 27D3 Miami	Moderate: percs slowly.	Severe: slope.
59 Lisbon	Severe: wetness.	Severe: wetness.
60C2 La Rose	Moderate: percs slowly.	Severe: slope.
60D2 La Rose	Moderate: slope, percs slowly.	Severe: slope.
62 Herbert	Severe: wetness.	Severe: wetness.
67 Harpster	Severe: wetness, floods.	Severe: wetness.
69 Milford	Severe: wetness, percs slowly, floods.	Severe: floods, wetness.
76 Otter	Severe: wetness, floods.	Severe: floods, wetness.
82 Millington	Severe: floods, wetness.	Severe: wetness.
93F* Rodman	Severe: slope.	Severe: seepage, slope.
103 Houghton	Severe: wetness, floods.	Severe: wetness, seepage, floods.
104 Virgil	Severe: percs slowly, wetness.	Severe: wetness, seepage.
105A, 105B Batavia	Slight	Severe: seepage.
125 Selma	Severe: wetness, floods.	Severe: seepage, wetness.
134, 134B Camden	Slight	Severe: seepage.
134C2 Camden	Slight	Severe: seepage, slope.
145A Saybrook	Moderate: percs slowly, wetness.	Moderate: seepage, wetness.
145B Saybrook	Moderate: percs slowly, wetness.	Moderate: slope, seepage, wetness.

See footnote at end of table.

TABLE 8.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas
145C2 Saybrook	Moderate: percs slowly, wetness.	Severe: slope.
146 Elliott	Severe: wetness, percs slowly.	Severe: wetness.
148A, 148B Proctor	Slight	Severe: seepage.
149 Brenton	Severe: wetness.	Severe: wetness.
152 Drummer	Severe: wetness, floods.	Severe: wetness, floods.
154 Flanagan	Severe: wetness.	Severe: wetness.
171A Catlin	Severe: wetness.	Moderate: seepage, wetness.
171B Catlin	Severe: wetness.	Moderate: seepage, slope, wetness.
194B Morley	Severe: percs slowly, wetness.	Severe: wetness.
194C, 194D Morley	Severe: percs slowly, wetness.	Severe: slope, wetness.
194E Morley	Severe: percs slowly, slope, wetness.	Severe: slope, wetness.
198 Elburn	Severe: wetness.	Severe: wetness, seepage.
199A Plano	Slight	Severe: seepage.
199B Plano	Slight	Moderate: seepage, slope.
206 Thorp	Severe: wetness, floods, percs slowly.	Severe: wetness, seepage, floods.
210 Lena	Severe: wetness, floods.	Severe: wetness, excess humus, seepage.
219 Millbrook	Severe: wetness, percs slowly.	Severe: wetness.
223B Varna	Severe: percs slowly, wetness.	Moderate: slope.
223C2 Varna	Severe: percs slowly, wetness.	Severe: slope.
233A, 233B	Severe:	Severe:

TABLE 8.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas
290A, 290B Warsaw	Slight	Severe: seepage.
298 Beecher	Severe: wetness, percs slowly.	Slight.
318A, 318B Lorenzo	Slight	Severe: seepage.
318C2 Lorenzo	Slight	Severe: slope, seepage.
323D Casco	Moderate: slope.	Severe: seepage, slope.
323E Casco	Severe: slope.	Severe: seepage, slope.
325A, 325B Dresden	Slight	Severe: seepage.
325C Dresden	Slight	Severe: seepage, slope.
327A, 327B Fox	Slight	Severe: seepage.
327C Fox	Slight	Severe: seepage, slope.
327D Fox	Moderate: slope.	Severe: seepage, slope.
329 Will	Severe: wetness, floods.	Severe: wetness, seepage.
330 Peotone	Severe: percs slowly, wetness.	Slight.
343 Kane	Severe: wetness.	Severe: wetness, seepage.
344A, 344B Harvard	Moderate: wetness.	Severe: seepage.
344C Harvard	Moderate: wetness.	Severe: seepage, slope.
347 Canisteo	Severe: wetness, floods.	Severe: wetness.
[illegible]	Slight	Severe:

TABLE 8.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas
531B Markham	Severe: percs slowly, wetness.	Moderate: slope.
531C2 Markham	Severe: percs slowly, wetness.	Severe: slope.
570B Martinsville	Slight	Severe: seepage.
570C Martinsville	Slight	Severe: seepage, slope.
656B Octagon	Moderate: percs slowly.	Moderate: slope, seepage.
656C2 Octagon	Moderate: percs slowly.	Severe: slope.
656D2 Octagon	Moderate: percs slowly, slope.	Severe: slope.
696B Zurich	Moderate: wetness.	Severe: seepage.
697 Wauconda	Severe: wetness.	Severe: seepage, wetness.
791A, 791B, 791C2 Rush	Moderate: percs slowly.	Severe: seepage.
792A, 792B Bowes	Slight	Severe: seepage.
792C Bowes	Slight	Severe: seepage, slope.
864*, 865*. Pits		
921B*:		
Faxon	Severe: wetness, depth to rock, floods.	Severe: wetness, depth to rock, floods.
Ripon	Severe: depth to rock.	Severe: depth to rock.
938C*:		
Miami	Moderate: percs slowly.	Severe: slope.
Casco	Slight	Severe: seepage, slope.
938E*:		
Miami	Severe: percs slowly, slope.	Severe: slope.
Casco	Severe: slope.	Severe: seepage, slope.
1103 Houghton	Severe: wetness, floods.	Severe: wetness, seepage, floods.

* See map unit description for the composition and behavior of the map unit.

TABLE 9.--CONSTRUCTION MATERIALS

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
24B, 24C2 Dodge	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
27B, 27C2 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.
27D3 Miami	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey, slope.
59 Lisbon	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
60C2 La Rose	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
60D2 La Rose	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
62 Herbert	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
67 Harpster	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
69 Milford	Poor: wetness, shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
76 Otter	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
82 Millington	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
93F* Rodman	Fair: slope.	Good	Good	Poor: small stones, slope.
103 Houghton	Poor: wetness, low strength.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess humus.
104 Virgil	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
105A, 105B Batavia	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
125 Selma	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
134A, 134B, 134C2----- Camden	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
145A, 145B, 145C2----- Saybrook	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
146	Poor:	Unsuited:	Unsuited:	Fair:

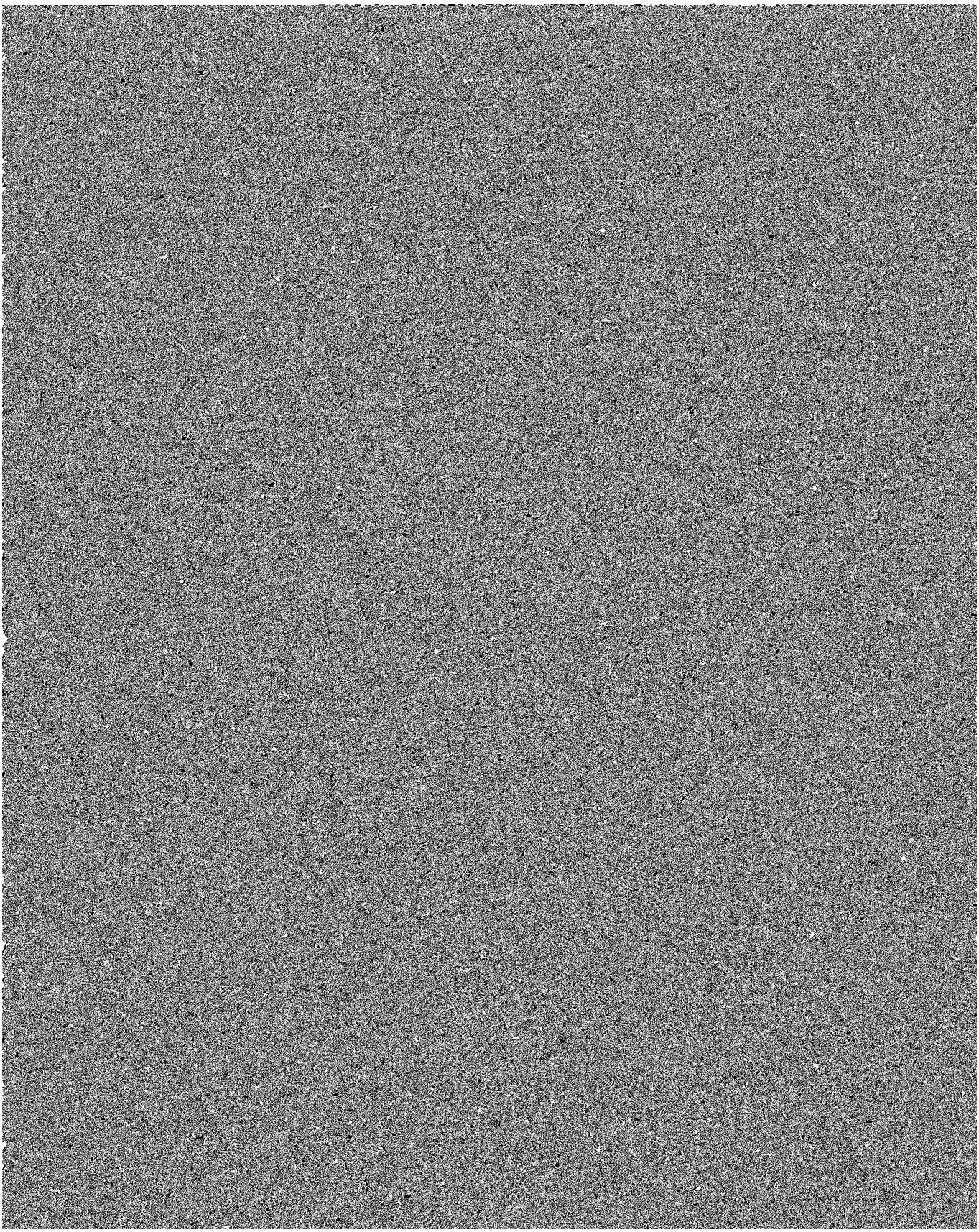

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
570B, 570C Martinsville	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
656B, 656C2 Octagon	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
656D2 Octagon	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
696B Zurich	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
697 Wauconda	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
791A, 791B, 791C2 Rush	Poor: low strength.	Good	Good	Fair: thin layer.
792A, 792B, 792C Bowes	Poor: low strength.	Good	Good	Fair: thin layer.
864*, 865*. Pits				
921B*:				
Faxon	Poor: wetness, low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Ripon	Poor: area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
938C*:				
Miami	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Casco	Good	Good	Good	Fair: thin layer.
938E*:				
Miami	Fair: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Casco	Fair: slope.	Good	Good	Poor: slope.
1103 Houghton	Poor: wetness, low strength.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess humus.

* See map unit description for the composition and behavior of the map unit.

TABLE 10.--WATER MANAGEMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. Absence of an entry means soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
24B---------- Dodge	Seepage-------	Piping--------	Not needed-----	Erodes easily--	Favorable------	Erodes easily.
24C2---------- Dodge	Seepage slope.	Piping--------	Not needed-----	Slope, erodes easily.	Favorable------	Erodes easily.
27B---------- Miami	Seepage-------	Piping--------	Not needed-----	Erodes easily--	Favorable------	Erodes easily.
27C2---------- Miami	Slope, seepage.	Piping--------	Not needed-----	Slope, erodes easily.	Favorable------	Erodes easily.
27D2, 27D3-------- Miami	Slope, seepage.	Piping--------	Not needed-----	Slope, erodes easily.	Slope----------	Slope, erodes easily.

TABLE 10.--WATER MANAGEMENT--Continued

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
223C2 Varna	Slope, seepage.	Favorable	Not needed	Slope	Percs slowly	Percs slowly.
233A Birkbeck	Seepage	Wetness	Frost action	Favorable	Not needed	Erodes easily.
233B Birkbeck	Seepage	Wetness	Frost action	Slope, erodes easily.	Wetness	Erodes easily.
233C2 Birkbeck	Slope, seepage.	Wetness	Frost action, slope.	Slope, erodes easily.	Wetness	Erodes easily.
236 Sabina	Seepage	Wetness	Frost action	Wetness, erodes easily.	Not needed	Erodes easily, wetness.
243A St. Charles	Seepage	Favorable	Not needed	Erodes easily	Not needed	Erodes easily.
243B St. Charles	Seepage	Favorable	Not needed	Erodes easily	Favorable	Erodes easily.
290A Warsaw	Seepage	Seepage	Not needed	Favorable	Not needed	Favorable.
290B Warsaw	Seepage	Seepage	Not needed	Favorable	Too sandy	Favorable.
298 Beecher	Favorable	Wetness	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Not needed	Erodes easily, percs slowly, wetness.
318A Lorenzo	Seepage	Seepage	Not needed	Droughty	Not needed	Droughty.
318B Lorenzo	Seepage	Seepage	Not needed	Droughty	Too sandy	Droughty.
318C2 Lorenzo	Seepage	Seepage	Not needed	Droughty, slope.	Too sandy	Droughty.
323D, 323E Casco	Seepage	Seepage	Not needed	Droughty, slope.	Slope, too sandy.	Droughty, slope.
325A Dresden	Seepage	Seepage	Not needed	Favorable	Not needed	Favorable.

TABLE 10--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
330 Peotone	Favorable	Wetness, hard to pack.	Percs slowly, floods, frost action.	Wetness, percs slowly, floods.	Not needed	Wetness.
343 Kane	Seepage	Seepage	Frost action	Wetness	Not needed	Wetness.
344A Harvard	Seepage	Piping	Not needed	Favorable	Not needed	Erodes easily.
344B Harvard	Seepage	Piping	Not needed	Favorable	Erodes easily	Erodes easily.
344C Harvard	Slope, seepage.	Piping	Not needed	Slope	Erodes easily	Erodes easily.
347 Canisteo	Seepage	Wetness	Frost action	Wetness, floods.	Not needed	Wetness.
361B Kidder	Seepage	Seepage	Not needed	Favorable	Favorable	Favorable.
361C Kidder	Seepage, slope.	Seepage	Not needed	Slope	Favorable	Favorable.
361D Kidder	Seepage, slope.	Seepage	Not needed	Slope	Slope	Slope.
369A	Seepage	Seepage	Not needed	Favorable	Not needed	Erodes easily.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
791A Rush	Seepage	Hard to pack	Not needed	Erodes easily	Not needed	Erodes easily.
791B, 791C2 Rush	Seepage	Hard to pack	Not needed	Erodes easily	Favorable	Erodes easily.
792A Bowes	Seepage	Favorable	Not needed	Favorable	Not needed	Erodes easily.
792B Bowes	Seepage	Favorable	Not needed	Favorable	Too sandy, erodes easily.	Erodes easily.
792C Bowes	Slope, seepage.	Favorable	Not needed	Slope	Too sandy, erodes easily.	Erodes easily.
864*, 865* Pits						
921B*:						
Faxon	Depth to rock	Thin layer, wetness.	Depth to rock, frost action.	Wetness, rooting depth.	Not needed	Wetness, depth to rock.
Ripon	Depth to rock, seepage.	Thin layer, piping.	Not needed	Rooting depth	Depth to rock, erodes easily.	Erodes easily, depth to rock.
938C*:						
Miami	Slope, seepage.	Piping	Not needed	Slope, erodes easily.	Favorable	Erodes easily.
Casco	Seepage	Seepage	Not needed	Droughty, slope.	Too sandy	Droughty.
938E*:						
Miami	Slope, seepage.	Piping	Not needed	Slope, erodes easily.	Slope	Slope, erodes easily.
Casco	Seepage	Seepage	Not needed	Droughty, slope.	Slope, too sandy.	Droughty, slope.
1103 Houghton	Seepage	Excess humus, low strength.	Frost action, excess humus.	Soil blowing, wetness, floods.	Not needed	Wetness.

* See map unit description for the composition and behavior of the map unit.

TABLE 11.--RECREATIONAL DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
24B Dodge	Slight	Slight	Moderate: slope.	Slight.
24C2 Dodge	Slight	Slight	Severe: slope.	Slight.
27B Miami	Slight	Slight	Moderate: slope.	Slight.
27C2 Miami	Slight	Slight	Severe: slope.	Slight.
27D2 Miami	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
27D3 Miami	Moderate: too clayey, slope.	Moderate: too clayey.	Severe: slope.	Moderate: too clayey.
59 Lisbon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
60C2	Slight	Slight	Severe:	Slight

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
125 Selma	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Severe: wetness.
134A Camden	Slight	Slight	Slight	Slight.
134B Camden	Slight	Slight	Moderate: slope.	Slight.
134C2 Camden	Slight	Slight	Severe: slope.	Slight.
145A Saybrook	Slight	Slight	Slight	Slight.
145B Saybrook	Slight	Slight	Moderate: slope.	Slight.
145C2 Saybrook	Slight	Slight	Severe: slope.	Slight.
146 Elliott	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
148A Proctor	Slight	Slight	Slight	Slight.
148B Proctor	Slight	Slight	Moderate: slope.	Slight.
149 Brenton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
152 Drummer	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Severe: wetness.
154 Flanagan	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
171A Catlin	Slight	Slight	Slight	Slight.
171B Catlin	Slight	Slight	Moderate: slope.	Slight.
194B Morley	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
194C Morley	Moderate: percs slowly.	Slight	Severe: slope.	Slight.
194D Morley	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight.
194E Morley	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
198 Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
199A Plano	Slight	Slight	Slight	Slight.
199B Plano	Slight	Slight	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
206---------- Thorn	Severe: floods	Severe: [illegible]	Severe: [illegible]	Severe: [illegible]

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
327A Fox	Slight	Slight	Slight	Slight.
327B Fox	Slight	Slight	Moderate: slope.	Slight.
327C Fox	Slight	Slight	Severe: slope.	Slight.
327D Fox	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
329 Will	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.
330 Peotone	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.
343 Kane	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
344A Harvard	Slight	Slight	Slight	Slight.
344B Harvard	Slight	Slight	Moderate: slope.	Slight.
344C Harvard	Slight	Slight	Severe: slope.	Slight.
347 Canisteo	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Severe: wetness.
361B Kidder	Slight	Slight	Moderate: slope.	Slight.
361C Kidder	Slight	Slight	Severe: slope.	Slight.
361D Kidder	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
369A Waupecan	Slight	Slight	Slight	Slight.
369B Waupecan	Slight	Slight	Moderate: slope.	Slight.
392*:				
Urban land.				
Orthents.				
442 Mundelein	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
531B Markham	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
531C2 Markham	Moderate: percs slowly.	Slight	Severe: slope.	Slight.
570B Martinsville	Slight	Slight	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
570C Martinsville	Slight	Slight	Severe: slope.	Slight.
656B Octagon	Slight	Slight	Moderate: slope.	Slight.
656C2 Octagon	Slight	Slight	Severe: slope.	Slight.
656D2 Octagon	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
696B Zurich	Slight	Slight	Moderate: slope.	Slight.
697 Wauconda	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
791A Rush	Slight	Slight	Slight	Slight.
791B, 791C2 Rush	Slight	Slight	Moderate: slope.	Slight.
792A Bowes	Slight	Slight	Slight	Slight.
792B Bowes	Slight	Slight	Moderate: slope.	Slight.
792C Bowes	Slight	Slight	Severe: slope.	Slight.
864*, 865*. Pits				
921B*:				
Faxon	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.
Ripon	Slight	Slight	Moderate: depth to rock, slope.	Slight.
938C*:				
Miami	Slight	Slight	Severe: slope.	Slight.
Casco	Slight	Slight	Severe: slope.	Slight.
938E*:				
Miami	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Casco	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
1103 Houghton	Severe: wetness, floods, excess humus.	Severe: wetness, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, excess humus.

* See map unit description for the composition and behavior of the map unit.

TABLE 12.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
24B---------- Dodge	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
24C2---------- Dodge	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27B---------- Miami	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
27C2---------- Miami	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27D2, 27D3--------- Miami	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
59----------	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair

TABLE 12.--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	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
146 Elliott	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
148A, 148B Proctor	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
149 Brenton	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
152 Drummer	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor.
154 Flanagan	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
171A, 171B Catlin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
194B Morley	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
194C, 194D Morley	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
194E Morley	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
198 Elburn	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
199A, 199B Plano	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
206 Thorp	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Good.

TABLE 12.--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	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
318C2 Lorenzo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
323D, 323E Casco	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
325A, 325B Dresden	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
325C Dresden	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
327A, 327B Fox	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

TABLE 12.--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	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
570C---------- Martinsville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
656B---------- Octagon	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
656C2, 656D2------- Octagon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
696B---------- Zurich	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
697---------- Wauconda	Good	Good	Good	Good	Fair	Fair	Poor	Good	Good	Poor.
791A, 791B, 791C2-- Rush	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
792A, 792B, 792C--- Bowes	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
864*, 865*. Pits										
921B*:										
Faxon----------	Fair	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
Ripon----------	Good	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
938C*:										
Miami----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Casco----------	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
938E*:										
Miami----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Casco----------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
1103---------- Houghton	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

* See map unit description for the composition and behavior of the map unit.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means greater than. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
24B, 24C2---------- Dodge	0-9	Silt loam-------	CL, CL-ML, ML	A-4	0	100	100	90-100	70-95	20-30	3-10
	9-24	Silty clay loam, silt loam.	CL, CH, ML, MH	A-6, A-7	0	100	100	90-100	70-95	35-55	15-25
	24-37	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
	37-60	Gravelly loam, gravelly sandy loam, gravelly silt loam.	ML, CL, SM, SC	A-2, A-4	1-5	75-90	65-90	60-80	15-70	15-30	NP-10
27B, 27C2, 27D2---- Miami	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	22-34	6-15
	11-29	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
	29-60	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
27D3---------- Miami	0-5	Clay loam-------	CL	A-6, A-7	0	100	90-100	75-95	65-95	30-45	15-25
	5-21	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
	21-60	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
59---------- Lisbon	0-13	Silt loam-------	ML, CL	A-6, A-7	0	100	100	95-100	80-95	35-50	10-20
	13-31	Silty clay loam	CL, CH	A-7, A-6	0	100	95-100	95-100	80-98	35-55	15-35
	31-60	Loam, clay loam, silt loam.	CL, ML	A-4, A-6, A-7	0-5	90-100	90-100	85-100	70-95	20-45	8-25
60C2, 60D2--------- La Rose	0-7	Loam----------	ML, CL, OL	A-6, A-7	0	100	95-100	90-100	60-95	30-50	11-20
	7-20	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
62---------- Herbert	0-12	Silt loam-------	ML, CL	A-6, A-7	0	100	100	95-100	85-100	35-50	11-30
	12-39	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0	95-100	95-100	95-100	85-100	35-55	15-30
	39-60	Loam, silt loam	CL	A-6, A-4	0	95-100	90-100	85-100	60-90	25-40	8-25
67---------- Harpster	0-14	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	90-100	45-60	20-35
	14-40	Silty clay loam, silt loam, loam.	CL, CH	A-7	0	100	95-100	95-100	80-100	40-60	20-35
	40-60	Stratified sandy loam to clay loam.	CL, CL-ML, SC, SM-SC	A-6, A-4, A-7	0	100	95-100	95-100	45-95	20-50	5-25
69---------- Milford	0-15	Silty clay loam	CL, CH	A-7	0	100	95-100	90-100	80-95	40-60	20-35
	15-47	Silty clay, silty clay loam, clay loam.	CH, CL	A-7	0	100	95-100	90-100	75-100	40-60	20-40
	47-60	Stratified clay to sandy loam.	CL	A-6, A-7	0	97-100	95-100	90-100	70-100	30-50	15-30

TABLE 13.--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	
76---------- Otter	0-39	Silt loam--------	CL	A-6, A-7	0	100	98-100	90-100	80-100	30-45	10-20
	39-60	Stratified silt loam to sandy loam.	CL, ML, SM, SC	A-4, A-6	0	90-100	80-100	55-95	45-85	20-40	3-20
82---------- Millington	0-17	Loam----------	ML, CL, OL	A-6, A-7, A-4	0	90-100	90-100	80-100	70-95	30-45	8-17
	17-28	Loam, silty clay loam, clay loam.	CL, ML	A-7, A-6	0	95-100	90-100	80-100	70-95	28-50	10-22
	28-60	Stratified sandy loam to silty clay loam.	CL, ML, CL-ML	A-6, A-7, A-4	0	80-100	90-100	80-100	60-95	20-45	5-20
93F*---------- Rodman	0-7	Gravelly sandy loam, sandy loam.	ML, CL, SM, GM	A-4	0-2	70-85	65-85	60-80	36-65	<30	3-9
	7-11	Gravelly loam, sandy loam, loam.	ML, CL-ML, SM-SC, SM	A-4, A-2, A-1	0-2	70-85	60-85	40-75	20-55	<25	NP-5
	11-60	Stratified sand to gravelly sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	22-55	7-20	2-10	---	NP
103---------- Houghton	0-65	Sapric material	Pt	---	0	---	---	---	---	---	---
104---------- Virgil	0-14	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	70-95	20-35	8-20
	14-48	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	15-30
	48-60	Loam, sandy loam, clay loam.	CL, SC, SM-SC, CL-ML	A-2, A-4, A-6	0-5	90-100	85-100	70-100	30-90	20-35	5-15
105A, 105B---------- Batavia	0-11	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	23-38	5-15
	11-42	Silty clay loam	CL	A-6	0	100	100	95-100	90-100	27-47	12-28

TABLE 13.--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	
148A, 148B--------- Proctor	0-8	Silt loam-------	CL	A-6	0	100	100	95-100	85-100	25-40	10-22
	8-37	Silty clay loam, clay loam.	CL	A-7, A-6	0	95-100	90-100	85-100	65-90	25-50	10-25
	37-60	Stratified loam to sandy loam.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	85-100	80-100	50-100	25-80	20-40	5-20
149---------- Brenton	0-17	Silt loam-------	CL, ML	A-6, A-4	0	100	95-100	95-100	80-100	30-40	5-15
	17-33	Silty clay loam	CL, ML	A-6, A-7	0	100	95-100	95-100	75-95	35-50	10-25
	33-60	Stratified silt loam to sandy loam.	CL-ML, CL, SM-SC, SC	A-4, A-6, A-2	0	95-100	85-100	80-100	30-85	20-35	5-20
152---------- Drummer	0-13	Silty clay loam	CL	A-6, A-7	0	100	95-100	85-100	72-95	30-50	15-30
	13-43	Silty clay loam, silt loam, clay loam.	CL	A-6, A-7	0	100	95-100	85-100	50-80	30-50	15-30
	43-60	Stratified sandy loam to silty clay loam.	SC, CL	A-4, A-6	0-5	95-100	85-95	75-95	45-80	20-35	7-20
154---------- Flanagan	0-15	Silt loam-------	CL	A-7, A-6	0	100	100	95-100	85-100	35-50	15-30
	15-42	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	85-100	40-60	15-30
	42-60	Loam, clay loam, silt loam.	CL, SC, CL-ML, SM-SC	A-4, A-6, A-7	0	85-100	80-100	70-100	36-100	20-45	5-30
171A, 171B--------- Catlin	0-13	Silt loam-------	ML, CL, OL	A-6, A-7	0	100	100	95-100	85-100	30-50	11-20
	13-43	Silty clay loam	CL, CH	A-7, A-6	0	100	100	90-100	80-100	35-60	20-30
	43-70	Loam, clay loam, silt loam.	CL	A-6, A-7	0	95-100	90-100	85-100	65-100	25-45	11-20
194B, 194C, 194D, 194E----------	0-10	Silt loam-------	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	90-100	85-95	25-40	5-15

TABLE 13.--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	
219---------- Millbrook	0-12	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	80-100	20-35	5-15
	12-29	Silty clay loam, clay loam.	CL	A-6, A-7	0	100	100	95-100	75-98	30-45	10-25
	29-60	Stratified loamy sand to clay loam.	SM, SC, CL, ML	A-4, A-6, A-2	0-5	95-100	90-100	80-100	30-85	<30	NP-15
223B, 223C2--------- Varna	0-11	Silt loam--------	CL	A-6, A-4	0-5	95-100	95-100	95-100	85-95	25-40	8-20
	11-30	Silty clay, silty clay loam, clay.	CL, CH	A-7, A-6	0-10	95-100	95-100	90-98	80-98	33-56	15-29
	30-60	Silty clay loam, clay loam.	CL	A-7, A-6	0-10	95-100	95-100	90-98	80-95	30-45	13-26
233A, 233B, 233C2-- Birkbeck	0-14	Silt loam--------	CL-ML, CL, ML	A-4, A-6	0	100	100	95-100	95-100	28-40	5-15
	14-42	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	95-100	95-100	85-100	30-50	10-25
	42-60	Clay loam, loam, silt loam.	CL, ML	A-4, A-6, A-7	0-5	95-100	85-100	70-100	55-75	25-45	5-20
236---------- Sabina	0-11	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	11-45	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	85-100	35-50	11-25
	45-60	Clay loam, silty clay loam, silt loam.	CL	A-4, A-6, A-7	0-5	95-100	90-100	70-100	55-75	25-45	8-20
243A, 243B---------- St. Charles	0-8	Silt loam--------	CL-ML, CL, ML	A-4, A-6	0	100	100	95-100	95-100	20-35	3-15
	8-41	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
	41-65	Stratified silt loam to sandy clay loam.	ML, SC, SM, CL	A-2, A-4	0-5	90-100	80-90	60-90	30-70	<25	3-10
290A, 290B---------- Warsaw	0-11	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	70-95	25-35	4-12
	11-24	Sandy clay loam,	SC, CL	A-6,	0-3	90-95	70-95	60-90	30-70	25-35	10-20

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
323D, 323E--------- Casco	0-8	Loam----------	ML, CL-ML, CL	A-4	0	95-100	90-100	75-100	50-75	20-30	3-10
	8-21	Clay loam, loam, sandy clay loam.	SC, CL, GC	A-6, A-7	0-5	60-100	55-100	55-90	35-70	25-45	11-25
	21-60	Sand and gravel	GP, SP, GP-GM, SP-SM	A-1, A-3, A-2	0-10	30-100	30-90	10-90	3-10	---	NP
325A, 325B, 325C--- Dresden	0-7	Silt loam-------	CL, CL-ML	A-6	0	100	100	95-100	85-100	20-40	5-15
	7-27	Silty clay loam, clay loam.	CL	A-6, A-7	0	100	90-100	90-100	85-95	30-45	10-25
	27-32	Gravelly clay loam, sandy clay loam.	CL	A-6, A-7	0-5	95-100	90-100	90-100	85-95	30-45	10-25
	32-60	Sand and gravel	GP, GP-GM, SP, SP-SM	A-1	10-35	45-70	40-50	30-50	0-10	---	NP
327A, 327B, 327C, 327D---------- Fox	0-9	Silt loam-------	ML, CL, CL-ML	A-4	0	95-100	85-100	75-95	55-90	20-30	3-10
	9-21	Silty clay loam, silt loam, clay loam.	CL	A-6', A-7	0	85-100	75-100	70-95	55-90	25-45	10-25
	21-34	Clay loam, loam, sandy clay loam, sandy loam.	CL, SC	A-2, A-6, A-7	0	85-100	75-95	50-95	20-65	25-45	10-25
	34-60	Sand and gravel	SP, SM, GP, GM	A-1, A-2, A-3	0-5	40-100	35-100	15-95	2-15	---	NP
329---------- Will	0-11	Silty clay loam	CL, OH, CH, OL	A-7	0	95-100	95-100	90-100	80-95	45-60	20-35
	11-31	Loam, clay loam, silty clay loam, sandy loam.	CL, CH	A-7, A-6	0-5	90-100	90-100	80-100	60-90	35-60	20-35
	31-60	Stratified sand to gravelly loamy sand.	GP, SP, GP-GM, SP-SM	A-1	1-10	40-80	40-70	40-50	0-10	---	NP
330---------- Peotone	0-14	Silty clay loam	OH, CH, CL, OL	A-7	0	100	95-100	95-100	80-100	40-65	15-35
	14-36	Silty clay loam, silty clay.	CH, CL	A-7	0-5	100	95-100	90-100	85-100	41-70	17-39
	36-60	Silty clay loam	CL, CH	A-7, A-6	0-5	95-100	95-100	90-100	75-98	30-60	14-29
343---------- Kane	0-11	Silt loam-------	CL, CL-ML	A-6, A-4	0	95-100	95-100	90-100	75-95	25-35	5-15
	11-28	Silty clay loam, clay loam.	CL, ML	A-6, A-7	0	95-100	95-100	90-100	80-95	35-45	10-20
	28-33	Sandy clay loam, sandy loam.	SC, CL	A-6, A-4	0-5	90-95	85-95	70-90	40-70	20-35	8-15
	33-60	Gravelly loamy sand, sand, gravel.	SP, GP, SP-SM, GP-GM	A-1	0-10	30-70	30-55	10-30	2-12	<5	NP
344A, 344B, 344C--- Harvard	0-8	Silt loam-------	CL	A-4, A-6	0	100	95-100	90-100	85-100	30-40	8-16
	8-29	Silty clay loam	CL	A-6, A-7	0	100	90-100	90-100	85-100	25-45	11-25
	29-60	Stratified clay loam to sand.	SM, SC, CL, ML	A-2, A-4, A-6	0	90-100	80-95	40-90	30-80	<35	NP-20

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
347---------- Canisteo	0-11	Loam----------	OL, CL	A-7	0	98-100	95-100	85-98	60-90	40-50	15-20
	11-35	Clay loam, loam	CL	A-6, A-7	0	98-100	90-100	85-95	65-85	38-50	25-35
	35-60	Clay loam, loam, sandy loam.	CL, ML, SM, SC	A-6, A-4	0-5	90-100	80-95	60-90	40-80	30-40	5-15
361B, 361C, 361D--- Kidder	0-8	Silt loam--------	ML, CL-ML, CL	A-4	0	95-100	95-100	85-100	60-90	20-30	3-10
	8-28	Clay loam, sandy clay loam, loam.	CL, SC	A-6, A-7	0-5	75-100	75-100	65-95	45-70	25-40	8-15
	28-60	Sandy loam, gravelly sandy loam.	SM	A-2	3-10	50-90	50-90	50-80	15-35	---	NP
369A, 369B--------- Waupecan	0-13	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	85-95	20-35	8-15
	13-38	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	85-95	35-45	15-25
	38-55	Stratified clay loam to gravelly loamy sand.	SM, SC, ML, CL	A-2, A-4, A-6	0	90-100	65-90	50-70	25-65	<25	NP-15
	55-60	Sand and gravel	GP, SP, SP-SM, GP-GM	A-1	10-35	40-95	30-85	30-50	0-15	---	NP
392*: Urban land.											
Orthents.											
442---------- Mundelein	0-12	Silt loam--------	ML, OL	A-4, A-6, A-7	0	95-100	95-100	95-100	85-95	30-50	5-20
	12-28	Silty clay loam	CL	A-7, A-6	0	95-100	95-100	95-100	75-95	35-50	15-25
	28-60	Stratified silt loam to fine sand.	SC, SM, ML, CL	A-2, A-4, A-6	0	90-100	90-100	60-90	10-75	<35	NP-20
531B, 531C2-------- Markham	0-7	Silt loam--------	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	90-100	85-95	23-40	6-17
	7-31	Silty clay, silty clay loam.	CL, CH	A-7	0-10	95-100	90-100	85-100	80-90	40-54	15-28
	31-60	Silty clay loam, clay loam.	CL	A-7, A-6	0-10	95-100	90-100	85-95	80-90	30-45	13-26
570B, 570C--------- Martinsville	0-14	Loam----------	CL, CL-ML	A-4, A-6	0	100	90-100	80-100	60-90	22-33	4-12
	14-42	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	100	90-100	65-90	40-90	20-35	8-17
	42-59	Sandy loam, silt loam, loam.	SM, ML	A-2-4, A-4	0	100	90-100	60-80	30-60	30-40	2-8
	59-70	Stratified sand to sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4	0	95-100	85-100	80-95	40-60	<25	4-9
656B, 656C2, 656D2- Octagon	0-13	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	13-30	Clay loam, silty clay loam.	CL	A-6, A-7	0	95-100	90-95	75-95	65-95	35-50	15-30
	30-60	Loam----------	CL, CL-ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	20-30	5-15
696B---------- Zurich	0-12	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	95-100	90-100	80-95	25-40	5-20
	12-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	60-90	30-45	10-25
	31-60	Stratified silt loam to fine sandy loam.	ML, CL, SM, SC	A-2, A-4, A-6	0	90-100	80-100	70-100	30-70	20-40	NP-20

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
697---------- Wauconda	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	100	95-100	80-100	20-35	6-15
	11-31	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	95-100	90-100	85-100	30-45	15-30
	31-60	Loam, silt loam, sand.	ML, CL, SM, SC	A-2, A-4, A-6	0	100	95-100	70-100	30-90	<30	NP-15
791A, 791B, 791C2-- Rush	0-11	Silt loam-------	CL	A-4, A-6	0	100	100	90-100	80-95	29-38	7-15
	11-41	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	85-95	44-52	21-26
	41-45	Clay loam, sandy clay loam, gravelly clay loam.	CL, SC	A-6, A-7, A-2	1-5	75-90	60-85	50-80	30-60	30-45	15-22
	45-60	Stratified sand to gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	1-5	30-70	22-55	7-20	2-10	<30	NP
792A, 792B, 792C--- Bowes	0-13	Silt loam-------	CL-ML, CL	A-4, A-6	0	100	100	95-100	85-100	25-35	5-15
	13-43	Silty clay loam	CL	A-6, A-7	0	95-100	95-100	90-100	85-100	35-45	15-25
	43-51	Gravelly clay loam, gravelly sandy loam, gravelly loamy sand.	CL, SC, ML, SM	A-2, A-4, A-6	5-20	30-85	30-80	25-75	25-65	<30	NP-15
	51-60	Sand and gravel	SP, GP, SP-SM, GP-GM	A-1	5-35	30-70	25-70	25-50	0-10	<20	NP-3
864*, 865*. Pits											
921B*:											
Faxon----------	0-13	Clay loam-------	CL	A-7	0-10	95-100	85-100	85-100	80-95	40-50	15-25
	13-28	Loam, sandy loam, clay loam.	CL, ML, SC, SM	A-7, A-6	0-10	95-100	70-100	65-95	40-85	30-50	10-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ripon----------	0-13	Silt loam-------	ML, CL-ML	A-4	0	100	100	85-95	80-90	20-30	NP-5
	13-29	Silty clay loam, silt loam.	ML, CL	A-6, A-7	0	100	100	85-95	80-90	35-45	10-15
	29-32	Clay loam, sandy clay loam, loam.	ML, SM, SC, CL	A-6, A-7	0-5	90-100	90-100	60-80	45-60	35-45	10-15
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
938C*, 938E*:											
Miami----------	0-11	Silt loam-------	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	22-34	6-15
	11-29	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
	29-60	Loam, clay loam, sandy loam.	CL, ML, CL-ML	A-4, A-6	0-3	88-94	83-89	74-87	50-64	17-30	2-14
Casco----------	0-8	Loam----------	ML, CL, CL-ML	A-4	0	95-100	90-100	75-100	50-75	20-30	3-10
	8-21	Clay loam, loam, sandy clay loam.	SC, CL, GC	A-6, A-7	0-5	60-100	55-100	55-90	35-70	25-45	11-25
	21-60	Sand and gravel	GP, SP, GP-GM, SP-SM	A-1, A-3, A-2	0-10	30-100	30-90	10-90	3-10	---	NP
1103---------- Houghton	0-65	Sapric material	Pt	---	0	---	---	---	---	---	---

* See map unit description for the composition and behavior of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol > means greater than. The erosion tolerance factor (T) is for the entire profile. Wind erodibility group is for the surface layer. Absence of an entry means 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 K	Erosion factors T	Wind erodibility group
	In	In/hr	In/in	pH				
24B, 24C2-------- Dodge	0-9	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5
	9-24	0.6-2.0	0.18-0.22	5.1-6.5	Moderate------	0.37		
	24-37	0.6-2.0	0.16-0.19	5.1-6.5	Moderate------	0.37		
	37-60	0.6-2.0	0.07-0.20	7.9-8.4	Low----------	0.37		
27B, 27C2, 27D2-- Miami	0-11	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	5
	11-29	0.6-2.0	0.15-0.20	5.6-6.0	Moderate------	0.37		
	29-60	0.6-2.0	0.05-0.19	6.6-8.4	Low----------	0.37		
27D3---------- Miami	0-5	0.6-2.0	0.18-0.20	5.6-7.3	Moderate------	0.37	4	6
	5-21	0.6-2.0	0.15-0.20	5.6-6.0	Moderate------	0.37		
	21-60	0.6-2.0	0.05-0.19	6.6-8.4	Low----------	0.37		
59---------- Lisbon	0-13	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	4	6
	13-31	0.6-2.0	0.18-0.22	6.1-7.8	Moderate------	0.43		
	31-60	0.6-2.0	0.07-0.11	6.6-8.4	Low----------	0.43		
60C2, 60D2------- La Rose	0-7	0.6-2.0	0.20-0.24	6.1-7.3	Low----------	0.32	5	5
	7-20	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		
62---------- Herbert	0-12	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5	6
	12-39	0.6-2.0	0.15-0.20	5.6-8.4	Moderate------	0.43		
	39-60	0.6-2.0	0.17-0.19	7.4-8.4	Low----------	0.43		
67---------- Harpster	0-14	0.6-2.0	0.21-0.24	7.4-8.4	Moderate------	0.28	5	4L
	14-40	0.6-2.0	0.17-0.22	7.4-8.4	Moderate------	0.28		
	40-60	0.6-2.0	0.11-0.22	7.4-8.4	Low----------	0.28		
69---------- Milford	0-15	0.6-2.0	0.12-0.23	6.1-7.3	High----------	0.28	5	4
	15-47	0.2-0.6	0.11-0.20	6.6-7.8	High----------	0.28		
	47-60	0.2-0.6	0.14-0.20	7.4-8.4	Moderate------	0.28		
76---------- Otter	0-39	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	6
	39-60	0.6-2.0	0.12-0.21	6.6-8.4	Low----------	0.28		
82---------- Millington	0-17	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.28	5	5
	17-28	0.6-2.0	0.17-0.20	7.4-8.4	Moderate------	0.28		
	28-60	0.6-2.0	0.14-0.20	7.4-8.4	Moderate------	0.28		
93F*---------- Rodman	0-7	2.0-6.0	0.10-0.12	6.6-7.8	Low----------	0.20	3	8
	7-11	2.0-6.0	0.09-0.12	6.6-7.8	Low----------	0.17		
	11-60	>20	0.02-0.04	7.4-8.4	Low----------	0.10		
103---------- Houghton	0-65	0.2-6.0	0.35-0.45	5.6-7.3	----------	---	---	3
104---------- Virgil	0-14	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.32	5	6
	14-48	0.2-2.0	0.18-0.20	5.1-6.5	Moderate------	0.43		
	48-60	0.6-6.0	0.11-0.19	6.6-8.4	Low----------	0.28		
105A, 105B------- Batavia	0-11	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.32	5	6
	11-42	0.6-2.0	0.18-0.20	5.1-6.5	Moderate------	0.43		
	42-60	0.6-6.0	0.11-0.20	5.6-7.3	Low----------	0.43		
125---------- Selma	0-13	0.6-2.0	0.17-0.22	6.1-7.8	Moderate------	0.28	5	6
	13-40	0.6-2.0	0.15-0.19	6.1-7.8	Moderate------	0.28		
	40-62	0.6-6.0	0.05-0.22	6.1-7.8	Low----------	0.28		
134A, 134B, 134C2---------- Camden	0-11	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	5	6
	11-44	0.6-2.0	0.16-0.20	5.1-6.5	Moderate------	0.37		
	44-60	0.6-6.0	0.12-0.18	5.6-7.3	Low----------	0.37		

See footnote at end of table.

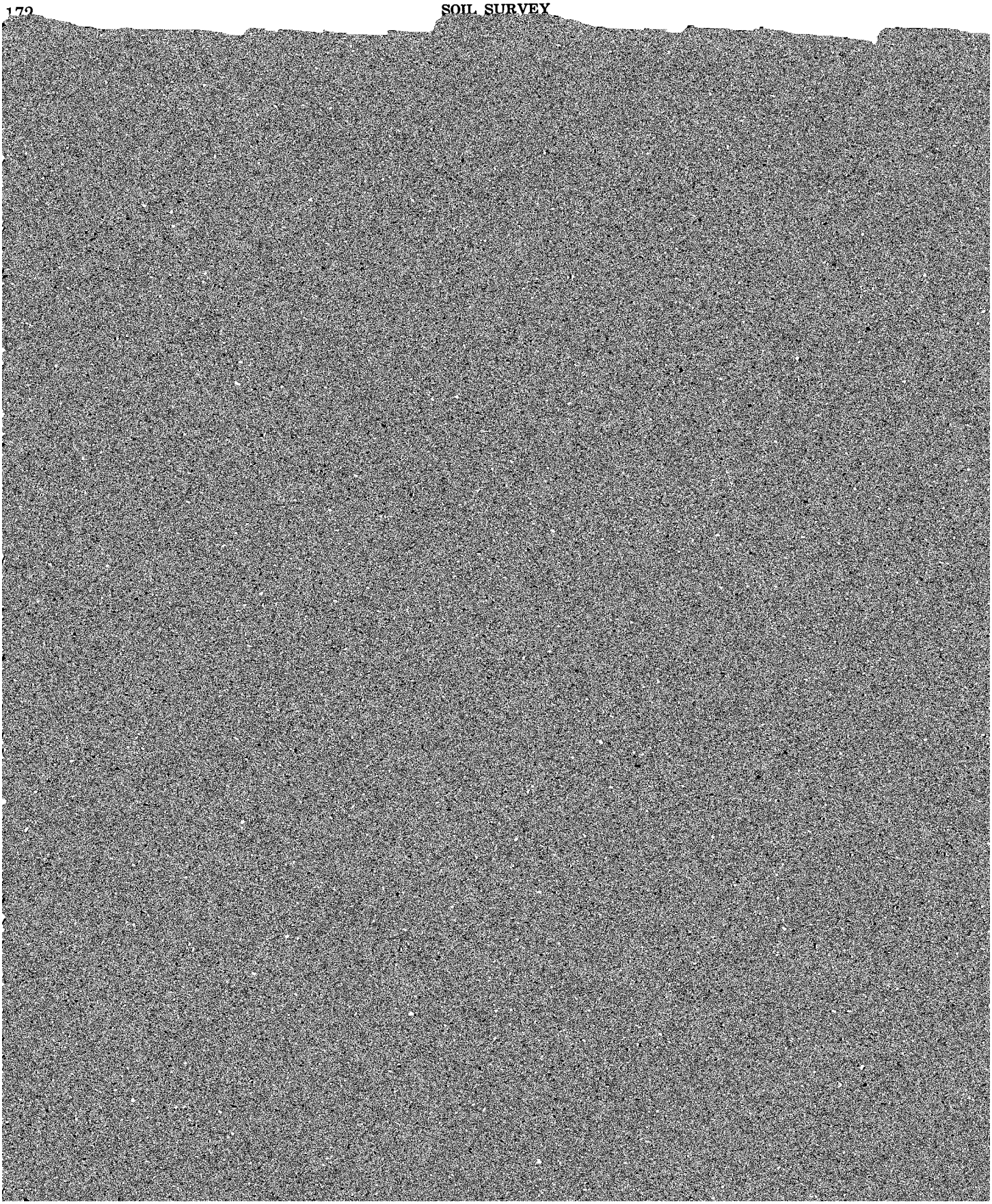

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permea-bility	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group
						K	T	
	In	In/hr	In/in	pH				

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group
	In	In/hr	In/in	pH				
442---------- Mundelein	0-12	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	5	6
	12-28	0.2-2.0	0.18-0.20	5.6-7.3	Moderate------	0.43		
	28-60	0.2-2.0	0.05-0.22	6.1-8.4	Low----------	0.43		
531B, 531C2------ Markham	0-7	0.6-2.0	0.22-0.24	5.6-6.5	Low----------	0.37	3	6
	7-31	0.06-0.6	0.11-0.20	5.1-7.8	Moderate------	0.37		
	31-60	0.06-0.6	0.14-0.20	7.4-8.4	Moderate------	0.37		
570B, 570C------- Martinsville	0-14	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	5
	14-42	0.6-2.0	0.17-0.20	5.1-6.0	Moderate------	0.37		
	42-59	0.6-2.0	0.12-0.14	5.6-6.5	Low----------	0.24		
	59-70	2.0-6.0	0.19-0.21	7.4-8.4	Low----------	0.24		
656B, 656C2, 656D2---------- Octagon	0-13	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	5
	13-30	0.6-2.0	0.15-0.20	5.6-8.4	Moderate------	0.32		
	30-60	0.6-2.0	0.05-0.19	7.9-8.4	Low----------	0.32		
696B---------- Zurich	0-12	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.37	5	6
	12-31	0.6-2.0	0.18-0.22	4.5-7.8	Moderate------	0.37		
	31-60	0.6-6.0	0.14-0.22	7.4-8.4	Low----------	0.37		
697---------- Wauconda	0-11	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	4	5
	11-31	0.6-2.0	0.18-0.20	5.6-7.8	Moderate------	0.43		
	31-60	0.6-6.0	0.05-0.22	7.4-8.4	Low----------	0.32		
791A, 791B, 791C2---------- Rush	0-11	0.6-2.0	0.22-0.24	5.1-6.0	Low----------	0.37	5	5
	11-41	0.6-2.0	0.18-0.20	5.6-6.0	Moderate------	0.37		
	41-45	0.6-2.0	0.15-0.19	5.6-7.3	Moderate------	0.37		
	45-60	>20	0.02-0.04	7.4-8.4	Low----------	0.10		
792A, 792B, 792C- Bowes	0-13	0.6-2.0	0.21-0.24	5.6-7.3	Low----------	0.32	5	6
	13-43	0.6-2.0	0.18-0.20	5.1-6.5	Moderate------	0.43		
	43-51	0.6-6.0	0.10-0.16	6.6-7.8	Low----------	0.17		
	51-60	6.0-20	0.02-0.04	7.9-8.4	Low----------	0.10		

TABLE 15.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. The definitions of "flooding" and "water table" in the Glossary explain such terms as "rare," "brief," and "perched." The symbol > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
24B, 24C2: Dodge	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	Moderate.
27B, 27C2, 27D2, 27D3: Miami	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
59: Lisbon	B	None	---	---	1.0-3.0	Apparent	Nov-May	>60	---	High	High	Moderate.
60C2, 60D2: La Rose	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
62: Herbert	B	None	---	---	1.0-3.0	Apparent	Mar-May	>60	---	High	High	Moderate.
67: Harpster	B/D	Occasional	Brief	Mar-Jun	0-2.0	Apparent	Feb-Jun	>60	---	High	High	Low.
69: Milford	B/D	Occasional	Brief	Apr-Jun	0-2.0	Apparent	Mar-Jun	>60	---	High	High	Low.
76: Otter	B/D	Frequent	Brief	Apr-Jun	0-2.0	Apparent	Apr-Jun	>60	---	High	High	Low.
82: Millington	B	Frequent	Brief	Apr-Jun	0-2.0	Apparent	Mar-Jul	>60	---	High	High	Low.
93F*: Rodman	A	None	---	---	>6.0	---	---	>60	---	Low	Low	Low.
103: Houghton	A/D	Frequent	Long	Nov-May	0-1.0	Apparent	Sep-Jun	>60	---	High	High	Low.
104: Virgil	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	High	Moderate.
105A, 105B: Batavia	B	None	---	---	>3.0	Apparent	Mar-May	>60	---	High	High	Moderate.
125: Selma	B/D	Occasional	Brief	Apr-Jun	0-2.0	Apparent	Mar-Jun	>60	---	High	High	Low.
134A, 134B, 134C2: Camden	B	None	---	---	>6.0	---	---	>60	---	High	Low	Moderate.
145A, 145B, 145C2: Saybrook	B	None	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High	High	Moderate.

See footnote at end of table.

BLE 15.--SOIL AND WATER FEATURES--Continued

ng		High water table			Bedrock		Potential frost action	Risk of corrosion	
ation	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
		Ft			In				
--	---	1.0-3.0	Perched-	Mar-May	>60	---	High-----	High-----	Moderate.
--	---	>6.0	---	---	>60	---	High-----	Moderate-	Moderate.
--	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
f-----	Mar-Jun	0-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
--	---	1.0-3.0	Apparent	Apr-Jun	>60	---	High-----	High-----	Moderate.
--	---	3.5-6.0	Apparent	Feb-May	>60	---	High-----	High-----	Moderate.
--	---	3.0-6.0	Perched-	Mar-May	>60	---	Moderate-	High-----	Moderate.
--	---	1.0-3.0	Apparent	Jan-May	>60	---	High-----	High-----	Moderate.
--	---	>6.0	---	---	>60	---	High-----	Moderate-	Low.
f-----	Mar-Jun	0-2.0	Apparent	Feb-Jun	>60	---	High-----	High-----	Moderate.
------	Nov-Jun	0-1.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
--	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
---	---	3.0-6.0	Perched-	Mar-May	>60	---	High-----	Moderate-	Moderate.
--	---	2.5-6.0	Apparent	Mar-May	>60	---	High-----	High-----	Moderate.
--	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
--	---	>6.0	---	---	>60	---	High-----	Moderate-	Moderate.
--	---	>6.0	---	---	>60	---	Moderate-	Low------	Moderate.
--	---	1.0-3.0	Perched-	Mar-Jun	>60	---	High-----	High-----	High.

TABLE 15.--SOIL AND WATER FEATURES--Continued

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--------	---	---	>6.0	---	---	>60	---	Low------	Moderate-	Moderate.
B	None--------	---	---	>6.0	---	---	>60	---	Moderate-	Low------	Low.
B	None--------	---	---	>6.0	---	---	>60	---	Moderate-	Moderate-	Low.
B	None--------	---	---	>6.0	---	---	>60	---	Moderate-	Low------	Moderate.
B/D	Occasional--	Brief-----	Apr-Jun	0-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
B/D	Occasional--	Long------	Feb-Jul	0-1.0	Perched-	Feb-Jul	>60	---	High-----	High-----	Moderate.
B	None--------	---	---	1.0-3.0	Apparent	Feb-Jun	>60	---	High-----	High-----	Moderate.
B	None--------	---	---	4.0-6.0	Apparent	Feb-May	>60	---	High-----	High-----	Moderate.
C/D	Common------	Brief-----	Mar-Jun	0-3.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
B	None--------	---	---	>6.0	---	---	>60	---	Moderate-	Moderate-	Low.
B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate-	Moderate.
B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
C	None--------	---	---	3.0-6.0	Perched-	Mar-May	>60	---	High-----	Moderate-	Moderate.
B	None--------	---	---	>6.0	---	---	>60	---	Moderate-	Moderate-	Moderate.
B	None--------	---	---	>6.0	---	---	>60	---	Moderate-	Moderate-	Moderate.
B	None--------	---	---	4.0-6.0	Apparent	Feb-Apr	>60	---	High-----	Moderate-	Moderate.

End of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
uency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
			Ft			In				
--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
--------	---	---	>6.0	---	---	>60	---	High-----	Moderate-	Moderate.
--------	---	---	>6.0	---	---	>60	---	High-----	Moderate-	Moderate.
on------	Very brief	Apr-May	0-1.0	Apparent	Nov-May	20-40	Hard----	High-----	High-----	Low.
--------	---	---	>6.0	---	---	20-40	Hard----	High-----	Moderate-	Moderate.
--------	---	---	>6.0	---	---	>60	---	Moderate-	Moderate-	Moderate.
--------	---	---	>6.0	---	---	>60	---	Moderate-	Low------	Low.
ent----	Long------	Nov-May	0-1.0	Apparent	Sep-Jun	>60	---	High-----	High-----	Low.

for the composition and behavior of the map unit.

TABLE 16.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics of this taxadjunct that are outside the range of the series]

Soil name	Family or higher taxonomic class
Batavia	Fine-silty, mixed, mesic Mollic Hapludalfs
Beecher	Fine, illitic, mesic Udollic Ochraqualfs
Birkbeck	Fine-silty, mixed, mesic Typic Hapludalfs
Bowes	Fine-silty, mixed, mesic Mollic Hapludalfs
Brenton	Fine-silty, mixed, mesic Aquic Argiudolls
Camden	Fine-silty, mixed, mesic Typic Hapludalfs
Canisteo	Fine-loamy, mixed (calcareous), mesic Typic Haplaquolls
Casco	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs
Catlin	Fine-silty, mixed, mesic Typic Argiudolls
Dodge	Fine-silty, mixed, mesic Typic Hapludalfs
Dresden	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Mollic Hapludalfs
Drummer	Fine-silty, mixed, mesic Typic Haplaquolls
Elburn	Fine-silty, mixed, mesic Aquic Argiudolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Faxon	Fine-loamy, mixed, mesic Typic Haplaquolls
Flanagan	Fine, montmorillonitic, mesic Aquic Argiudolls
Fox	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs
Harpster	Fine-silty, mesic Typic Calciaquolls
Harvard	Fine-silty, mixed, mesic Mollic Hapludalfs
Herbert	Fine-silty, mixed, mesic Udollic Ochraqualfs
Houghton	Euic, mesic Typic Medisaprists
Kane	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Argiudolls
Kidder	Fine-loamy, mixed, mesic Typic Hapludalfs
La Rose	Fine-loamy, mixed, mesic Typic Argiudolls
Lena	Euic, mesic Typic Medisaprists
Lisbon	Fine-silty, mixed, mesic Aquic Argiudolls
Lorenzo	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
Markham	Fine, illitic, mesic Mollic Hapludalfs
Martinsville	Fine-loamy, mixed, mesic Typic Hapludalfs
Miami	Fine-loamy, mixed, mesic Typic Hapludalfs
Milford	Fine, mixed, mesic Typic Haplaquolls
Millbrook	Fine-silty, mixed, mesic Udollic Ochraqualfs
Millington	Fine-loamy, mixed (calcareous), mesic Cumulic Haplaquolls
Morley	Fine, illitic, mesic Typic Hapludalfs
Mundelein	Fine-silty, mixed, mesic Aquic Argiudolls
Octagon	Fine-loamy, mixed, mesic Mollic Hapludalfs
Otter	Fine-silty, mixed, mesic Cumulic Haplaquolls
Peotone	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Plano	Fine-silty, mixed, mesic Typic Argiudolls
Proctor	Fine-silty, mixed, mesic Typic Argiudolls
Ripon	Fine-silty, mixed, mesic Typic Argiudolls
Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls
Rush	Fine-silty, mixed, mesic Typic Hapludalfs
Sabina	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Saybrook	Fine-silty, mixed, mesic Typic Argiudolls
Selma	Fine-loamy, mixed, mesic Typic Haplaquolls
St. Charles	Fine-silty, mixed, mesic Typic Hapludalfs
Thorp	Fine-silty, mixed, mesic Argiaquic Argialbolls
Varna	Fine, illitic, mesic Typic Argiudolls
Virgil	Fine-silty, mixed, mesic Udollic Ochraqualfs
Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
Wauconda	Fine-silty, mixed, mesic Udollic Ochraqualfs
Waupecan	Fine-silty, mixed, mesic Typic Argiudolls
Will	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplaquolls
Zurich	Fine-silty, mixed, mesic Typic Hapludalfs

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