United States
Department of
Agriculture

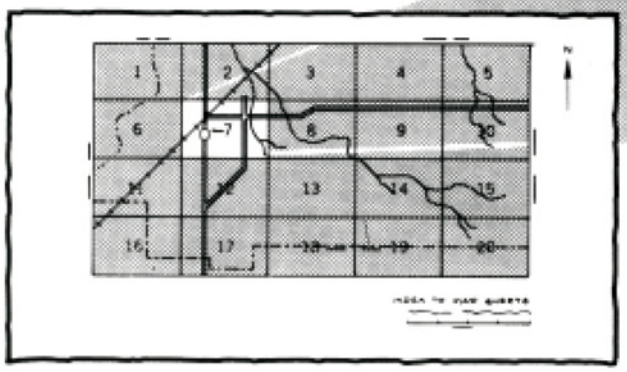
Soil
Conservation
Service

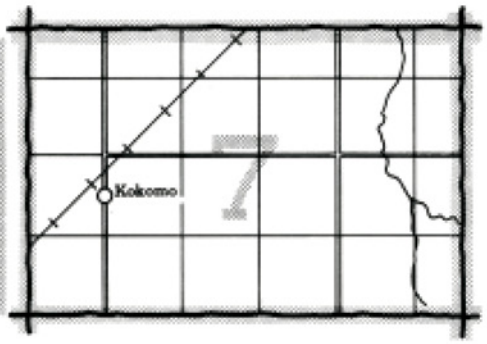
In cooperation with
Cornell University
Agricultural Experiment
Station

Soil Survey of Rensselaer County, New York

HOW TO USE

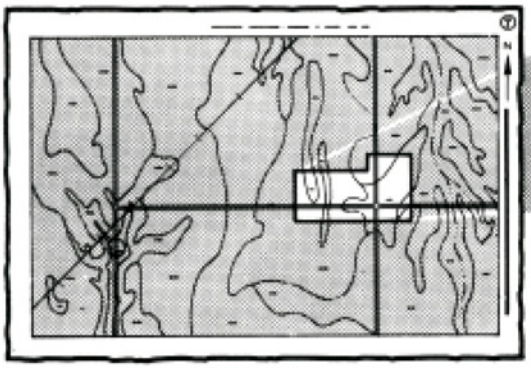
1. Locate your area of interest on the "Index to Map Sheets"

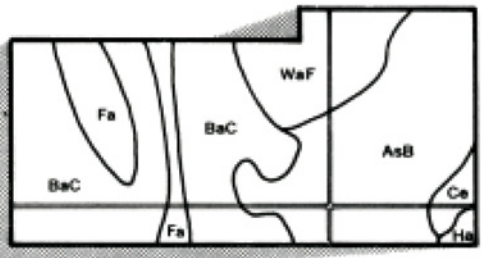




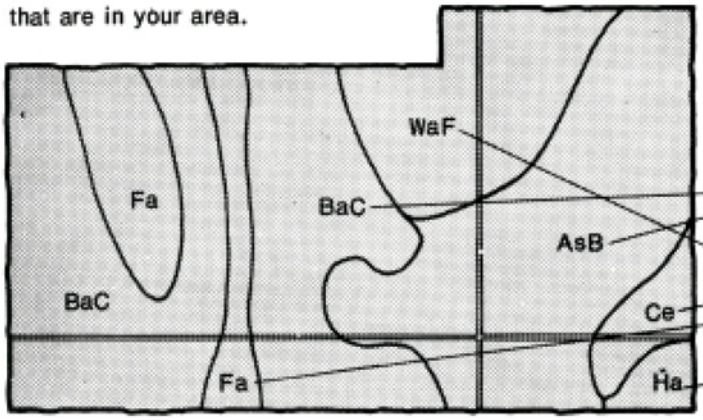
2. Note the number of the map sheet and turn to that sheet.

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





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

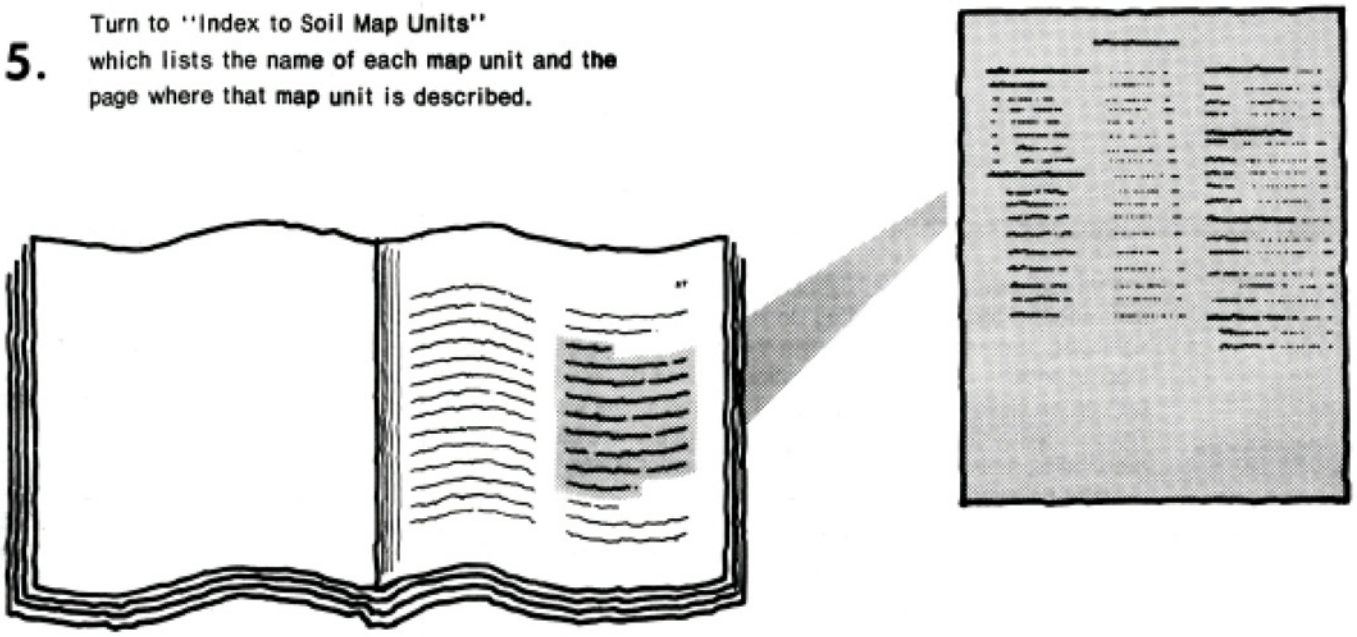


Symbols

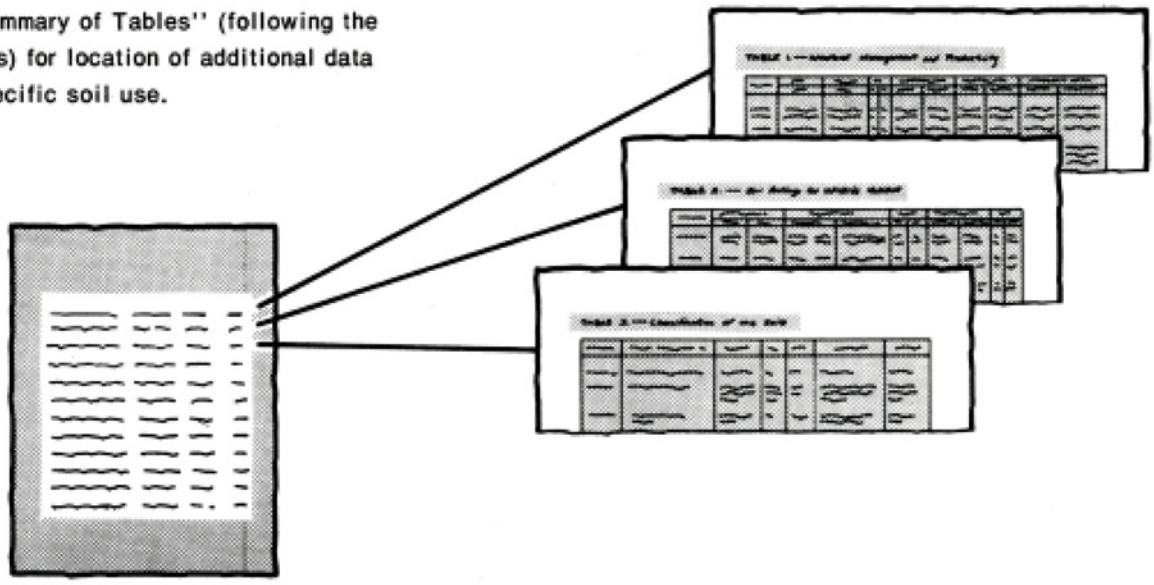
AsB
BaC
Ce
Fa
Ha
WaF

THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was completed in 1979. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979. This survey was made cooperatively by the Soil Conservation Service and the Cornell University Agricultural Experiment Station. It is part of the technical assistance furnished to the Rensselaer County Soil and Water Conservation District. Partial funding for the survey was provided by the Rensselaer County Legislature for the Rensselaer County Soil and Water Conservation District.

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

Cover: The soils on the flood plain at the junction of the Hoosic River and the Hudson River are highly productive and are classed as prime farmland. The soils are Hamlin silt loam, 0 to 3 percent slopes, and Teel silt loam, 0 to 3 percent slopes.

Contents

Soil Series

Issued January 1988

Index to Map Units

Summary of Tables

Foreword

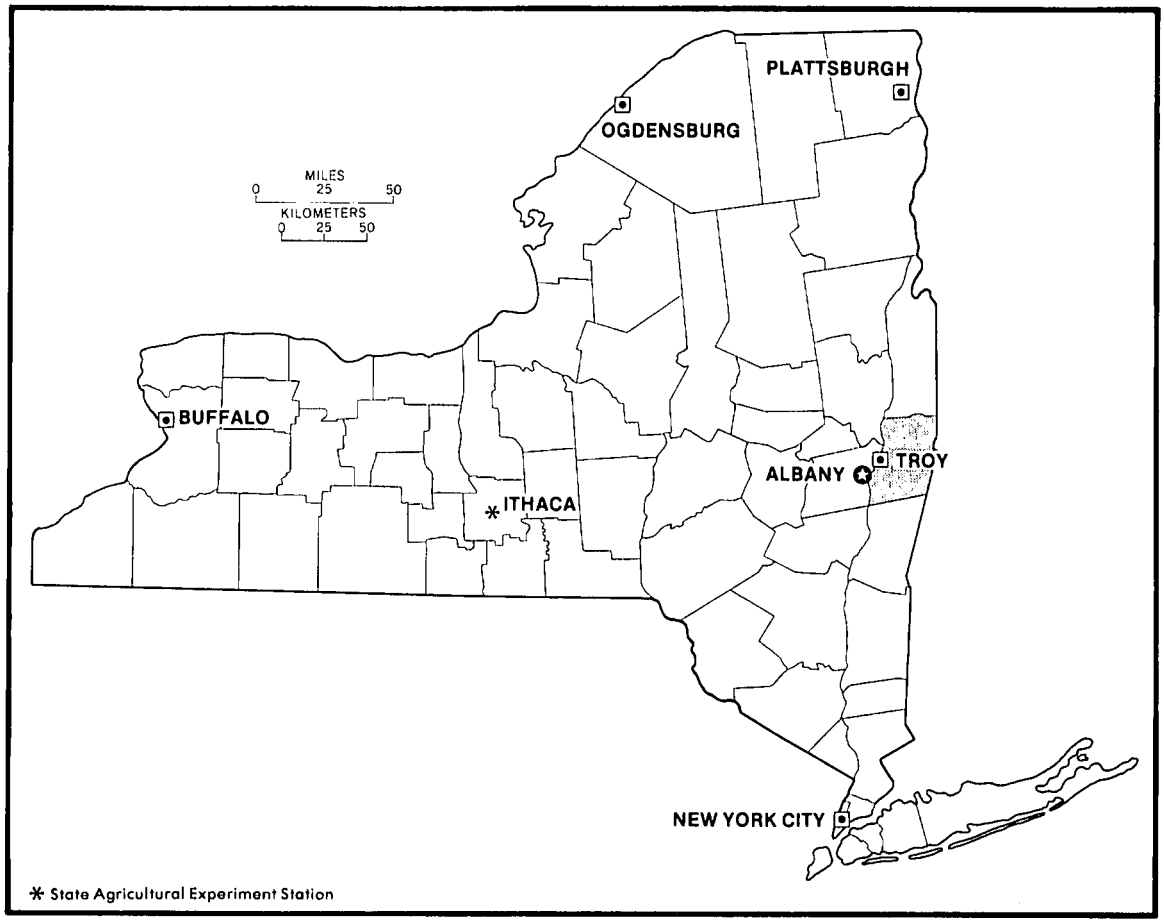
This soil survey contains information that can be used in land-planning programs in Rensselaer County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact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

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

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

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

Paul A. Dodd
State Conservationist
Soil Conservation Service



Location of Rensselaer County in New York.

Soil Survey of Rensselaer County, New York

By Ralph Work, Soil Conservation Service

Fieldwork by William A. Broad, Steven C. Carlisle, Marilyn E. Cassidy, Seymour D. Goodman, Robert J. Landry, Jackie Mangum, Karl S. Olsen, Gerald L. Rosenberg, Mark H. Silverman, Theodore D. Trevail, Harvel E. Winkley, and Ralph Work, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
In cooperation with
Cornell University Agricultural Experiment Station

RENSSELAER COUNTY, on the east side of the Hudson River in the eastern part of New York State, is approximately 135 miles north of New York City. The county is roughly rectangular and is 27 miles wide between the Hudson River and the State line. The area of the county is 665 square miles, or 425,600 acres. Troy is the county seat.

About 26 percent of the county is in farms *(16).* Of this area, about 60 percent is used for crops, including pasture, and the rest is in woodland and other uses.

Land use changed between 1959 and 1974. A large acreage that was farmed in 1959 is now out of production. Much of this is idle. A considerable acreage, particularly in the central and western parts of the county, has been developed for urban uses. Operating farms are scattered throughout this area.

Although still extensive, dairy farming decreased considerably during this period. High-value crops are grown on a large acreage of alluvial and terrace soils in the Hudson and Hoosic River valleys. Sweet corn, vegetables, and fruits are grown, as well as general dairy crops. Parttime farming has increased during the past 10 years. Large acreages are rented out for crop production.

Large forested areas are in the eastern regions of the grit plateau and the Taconic Range where the terrain is very rough and steep. Many wooded areas have been cut over several times for lumber.

An older soil survey of Rensselaer County was published in 1937 *(11).* The present survey updates the earlier one and provides additional information and larger maps that show the soils in greater detail.

General Nature of the County

This section provides general information about Rensselaer County. It discusses settlement and development, industry and transportation, physiography and geology, drainage, water supply, and climate.

Settlement and Development

Settlement of Rensselaer County began as early as 1627. In 1630 Kilian Van Rensselaer, a pearl and diamond merchant, began continuous settlement, under the Dutch patroon system, of an area encompassing the present Albany and Rensselaer Counties and part of Columbia County.

The area prospered and grew, but much of Rensselaer County south of Schaghticoke, Pittstown, and Hoosick was overgrazed and cultivated. With little attention given to protecting the soil, large areas of sloping land suffered accelerated erosion. Although there was some erosion in the three northern towns, the farms generally were managed better.

In 1791 Rensselaer County was established from a portion of the original Albany County and consisted of five towns. Over the next century these towns were divided and by 1904 the present number of fourteen towns, five villages, and two cities was reached.

The cities of Troy and Rensselaer are surrounded by densely populated suburbs, while the remainder of the county is sparsely populated. Some villages have been gaining inhabitants who commute to urban jobs. The county population was 119,781 in 1930 and 156,746 in 1975.

Industry and Transportation

Rensselaer County holds an important position in the Hudson River valley. Industry and excellent transportation facilities have increased growth and development and support an expanding economy.

The Hudson River provided transportation, easy access to markets, power, and communication to the early settlers in the area. Locally grown farm produce was shipped on the river to more densely populated areas of the eastern seaboard. Some settlers harnessed the power of streams rushing from the grit plateau, and small milling operations processed the products of farm and forest. As population and the commercial base grew, the Hudson-Mohawk River confluence at Troy fostered industrial development in the late 1800's. The cities of Troy and Rensselaer remain the manufacturing, transportation, and employment centers of the county today.

There has been a long history of industry in Rensselaer County. Iron and steel manufacture and fabrication in Troy and Rensselaer began early and thrived on the ready availability and convenience of water power. Excellent transportation by water, rail, and highway enhanced the growth of industry and commerce. Chemical, textile, drug, and paper industries employ many residents. The Hoosic and Walloomsac Rivers in the northern part of the county support a number of important industries in the Hoosick Falls and Schaghticoke areas.

Rensselaer and Troy are important port terminals at the northern limit of the tidewater channel on the Hudson River and at the termini of the canal from Lakes Erie and Ontario and of the canal system that takes barge traffic north to Montreal. Railroad transportation for passengers and cargo is available. The county is served by a network of state and federal highways.

Physiography and Geology

This section was prepared by Robert G. LaFleur, Department of Geology, Rensselaer Polytechnic Institute, and Bernard S. Ellis, senior staff geologist, Soil Conservation Service.

The landscape of Rensselaer County rises 2,800 feet from tidewater at the Hudson River to the top of Berlin Mountain in the Taconic Mountains, 20 miles to the east.

Before the Pleistocene glaciations, a bedrock landscape was formed under strong, complex structural and bedrock control exerted by folded and thrustfaulted Cambrian and Ordovician sedimentary rocks *(3)* (fig. 1). Deformation occurred during the Taconic and Acadian mountain-building periods. Although all bedrock in this county is strongly folded and fractured, the regional metamorphism of western New England affected mainly the overthrust phyllites and green schists of the Taconic Range and the Rensselaer Graywacke. Sandstones, shales, and minor limestones west of the Taconic Range escaped alteration *(6)*.

Erosion of the Taconic rocks through millions of years produced three distinct physiographic provinces. Along the western edge of the New England Upland, schists of the Taconic Range have been dissected sharply by the Hoosic River and its tributaries *(9)*. Glacial scour has also accentuated a bedrock relief there of nearly 2,400 feet. The Taconic and Macomber soils are common at higher elevations in this part of the county.

By contrast, the Rensselaer Plateau, which is also called the grit plateau, is a gently rolling upland that occupies most of the central part of the county. It formed on the very resistant Rensselaer Graywacke. Steep escarpments rim the plateau on all sides, but the broad summit at about 1,500 feet seldom achieves a local relief of more than a few tens of feet. Large boulders and occasional outcrops of massive green sandstone occur on the plateau in a hemlock-maple-beech forest containing numerous swamps and bogs.

The western third of the county lies in the Taconic Slate Belt, which is structurally a part of the Ridge and Valley Province. The Slate Belt lies within a much subdued Hudson-Champlain Lowland where infrequent rock outcrops are aligned parallel to the north-south structural grain.

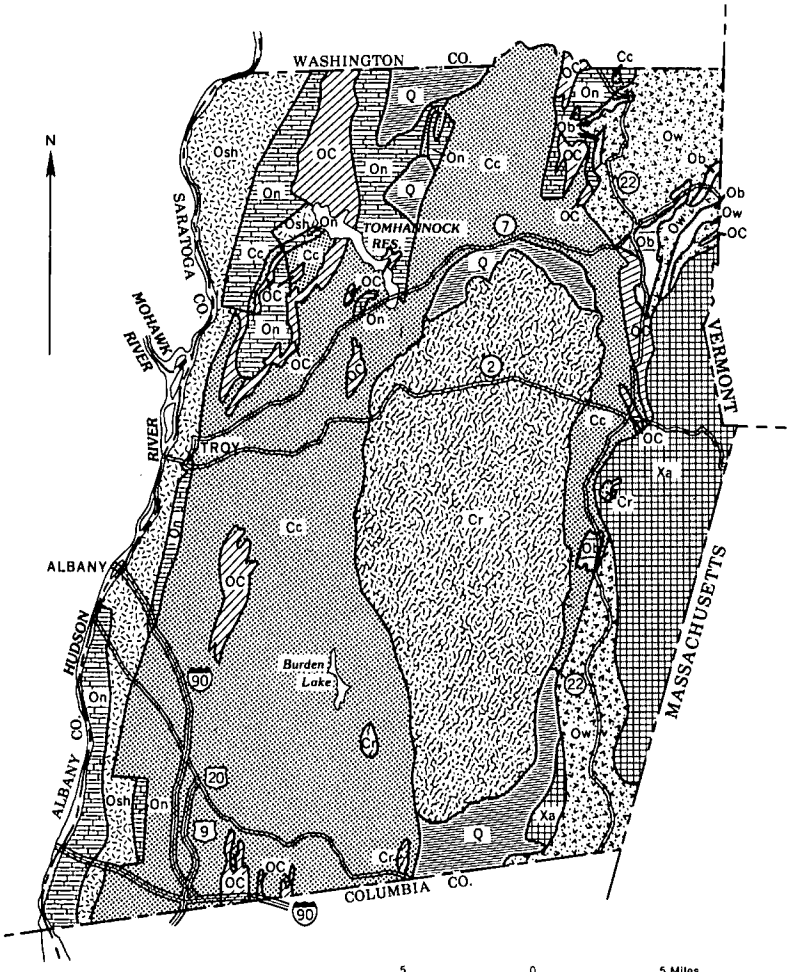
Ice completely covered the county during the last glaciation, some 23,000 to 13,500 years ago. The advancing glacier stripped away most of the preglacial deposits and weathering products, so the glacial sediments lie directly on the rock surface.

Although repeated continental glaciations quarried and smoothed the rock landscape to some extent, the most obvious contribution of the ice is the wide variety of overburdens that now cover the county. Because the Slate Belt lies within the Hudson-Champlain Lowlands, it received particularly abundant deposits during the last glaciation. This overburden effectively obscures the north-south bedrock structural trend except where large outcrops occur. Nassau soils developed in areas where the glacial sediment cover is very thin over shale.

All of the soils in the county have formed in the 13,500 years since the glacier left the area. Soils on postglacial alluvial terraces and flood plains are even younger.

Lodgement till, known as "hardpan and boulders" to well drillers, is a poorly sorted, stony and loamy material laid down by advancing ice. Smooth, elliptical hills called "drumlins" have their long axis parallel to the ice flow and are composed mainly of till. Drumlins are abundant throughout the Slate Belt but rare elsewhere in the county. Soils of the Bernardston, Pittstown, and Scriba series formed in and near drumlins.

As the ice sheet receded, flows of meltwater carried away gravel and sand, often in direct contact with the melting glacier. Eskers and kames are common in the uplands where meltwater was channeled through crevasses and ice tunnels. A large complex area of gravelly outwash terraces and kames extends from south of Burden Lake northwest to Troy *(8)*. In the Hudson



LEGEND

CENOZOIC

Q — Quarternary Glacial and Alluvial Deposits, Underlying Geology Unknown.

PALEOZOIC

Osh — Middle Ordovician Trenton Group (black shales)
Snake Hill Shale

On — Middle Ordovician Trenton Group
Normanskill Formation: Austin Glen Member-graywacke, black and gray shales.

Ow — Wallomsac Slate - black.

Ob — Upper Cambrian and Lower Ordovician Beekmantown and Saratoga Springs Groups
Tribes Hill Formation - limestone, dolomite.

OC — Upper Cambrian and Lower Ordovician
Schaghticoke Formation - shale, limestone.

Cc — Lower Cambrian Cossavuna Group - Taconia Area
West Castleton and "Schodack" Formations - black shale, limestone, limestone brecciola.

Cr — Rensselaer Graywacke

Xa — Age Unknown Probably Lower Cambrian "Berkshire" Formation
Austerlitz Phyllite

Figure 1.—Bedrock geology of Rensselaer County.

Valley along the margins of the main ice mass, larger gravelly and sandy terraces and kames formed while glacial Lake Albany expanded northward. Well drained to excessively drained Hoosic and Chenango soils formed in these deposits. As the ice margin receded northward through the Hudson Valley, lacustrine clays and silts, derived mostly from melting ice, accumulated as much as 200 feet thick in the Lake Albany basin. The Unadilla and Hudson soils developed in this slowly permeable, finely gullied, often unstable deposit. The somewhat poorly drained Rhinebeck soils and the poorly drained and very poorly drained Madalin soils are in depressions. Elmridge soils formed in sand deposited over clay in subsequent glacial lakes.

While glacial Lake Albany occupied the Hudson Valley, major tributaries, such as the Hoosic River, built large sand deltas into the lake. Well drained to excessively drained Hoosic soils later developed on terraces formed of these deposits. Within a large area in the northwestern part of the county, terraces are stepped, marking temporary pauses in the downcutting of the Lake Albany-Hoosic Delta by the postglacial Hoosic River.

Recession of the ice across the Rensselaer Plateau had different effects. Poorly drained, stagnant ice deposited bouldery ablation till over massive rock ridges, subduing the relief of the rugged rock surface *(9).* Small knobby hills of loam, gravel, and sand typical of deadice moraines form low ridges that extend across the swampy upland. Soils here are difficult to differentiate and are mapped as well drained to moderately well drained Buckland soils and somewhat poorly drained to poorly drained Brayton soils.

Modern alluvium covers the bottom lands along major tributaries to the Hudson River. The well drained Hamlin, moderately well drained Teel, and poorly drained Limerick soils developed in this material. Bluffs of gullied Lake Albany clay overlook a wider Hudson River flood plain all along the western border of the county. Mixed fluvial gravel, colluvial silt and clay, and small fan deposits make up the modern flood plain. In many places north of Troy, the Hudson flows directly on bedrock, and locks and dams are necessary to permit navigation northward through the Champlain Canal.

Drainage

Rensselaer County lies entirely within the Hudson River drainage basin *(6).* The northern part of the county is drained by the Hoosic River and its tributaries, the Little Hoosic River and the Walloomsac River. Other important streams that flow into the Hudson River are the Poesten Kill, Wynants Kill, Moordener Kill, Valatie Kill, Muitzes Kill, and Kinderhook Creek. Many smaller streams enter the Hudson River directly, having cut deep ravines into the clay terraces of the lake plain that flanks the river.

The larger tributaries of the Hudson flow through hanging valleys into deep ravines that have been cut into the terrace-capped shale adjacent to the escarpment. Below Schaghticoke, the Hoosic River has cut a canyon nearly 200 feet deep. Poesten Kill, which drains a large area of the Rensselaer Plateau, has cut a deep gorge. There is a high, picturesque waterfall at Barbersville, just east of Poestenkill Village.

All of the tributaries that drain the eastern Taconic Range have low gradients, except for tributaries of the Little Hoosic River. Here, the small streams that flow out of the hollows to the east in narrow, steepsided valleys have a high velocity during high water, and time of concentration to peak flow is very short at Berlin and on down the valley through Petersburg. The streams that flow westerly across the lake plain to the Hudson have the steepest gradient where they cut into bedrock as they flow across the escarpment.

Water Supply

The largest source of surface water in the county is the Hudson River, but the State Health Department has restricted its use. The city of Troy obtains water from reservoirs on some of the smaller streams. Most communities have deep wells into groundwater aquifers. The outwash terrace areas in East Greenbush and Schodack are notable examples. Private wells serve many homes.

Most major valleys that cut the lake plain contain thick deposits of sand and gravel that are excellent sources of ground water *(6, 10).* The other major source of ground water is fractures in the bedrock. Wells in these fractures generally yield adequate water for residential use.

In general, the quality of water, both surface and underground, is good. Surface water is occasionally exposed to contamination, but contamination is not a major problem in this county. Hardness of ground water depends on the aquifer and can be a nuisance in some areas. Near Troy, many wells have limited supply, some are polluted, and others contain iron, salt, or hydrogen sulfide.

A study of water resources by the Rensselaer County Health Department indicates that water supply systems need improvement, including further development and expansion of public systems. As suburban towns continue to grow, their need for potable water will increase.

Climate

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

In Rensselaer County, winters are cold and summers are moderately warm with occasional hot spells. Mountains are markedly cooler than the main agricultural areas in the lowlands. Precipitation is well distributed throughout the year and is nearly always adequate for all

crops. Winter snows are frequent and occasionally come as blizzards. Snow covers the ground much of the season.

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

In winter the average temperature is 24 degrees F, and the average daily minimum temperature is 15 degrees. The lowest temperature on record, which occurred at Albany on January 19, 1971, is 28 degrees. In summer the average temperature is 69 degrees, and the average daily maximum temperature is 81 degrees. The highest recorded temperature, which occurred at Albany on July I8,1953 is 100 degrees.

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

The total annual precipitation is 38 inches. Of this, 19 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 15 inches. The heaviest 1-day rainfall during the period of record was 3.5 inches at Albany on August 28, 1971. Thunderstorms occur on about 30 days each year, and most occur in summer.

The average seasonal snowfall is 67 inches. The greatest snow depth at any one time during the period of record was 36 inches. On an average of 44 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time possible in summer and 40 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in spring.

How This Survey Was Made

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

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

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

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

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the fieldobserved characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production

records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

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

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

Map Unit Composition

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

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

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

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape *(4)*. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

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

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

The general soil map units in Rensselaer County are described below. The introductory statement for each unit applies to the major soils; the texture refers to the surface layer of those soils. Some map units include soils that are less or more sloping than the major soils; the text indicates the range of slope within each unit.

A general soil map was published in the soil survey of Washington County, New York. The names of adjoining units on that map and this one are not exactly the same because proportions of major soils differ from one survey area to another. The maps do not join perfectly because of the difference in scale of the two maps. Concepts and names of some soils have changed as a result of changes in the classification system since publication of the survey for Washington County.

Areas Dominated by Soils That Formed in Glacial Till

The soils in this group make up about 80 percent of the county. Most of these soils formed in deep to shallow glacial till derived from shale, slate, sandstone, or phyllite. The soils range from gently sloping to very steep, and are mostly moderately well drained to somewhat excessively drained. Many areas, where the soils are deep and have suitable slope, are used for crops grown on dairy farms. Where the soils are shallow or steep or have numerous large stones on the surface or rock outcrops, the areas are used mostly for forest or are idle.

1. Bernardston-Pittstown-Nassau

Dominantly gently sloping to hilly, moderately well drained to somewhat excessively drained, medium textured soils, some of which are deep and have a fragipan and some of which are shallow over shale bedrock; on uplands

These soils formed in shaly glacial till. The landscape is a series of ridges, knolls, and low hills (fig. 2). The topography is complex because of the underlying folded shale and slate bedrock. Bedrock is exposed in many places. Slope is mainly 3 to 25 percent but ranges from 3 to 40 percent.

This map unit makes up about 40 percent of the county. It is about 30 percent Bernardston soils, 15 percent Pittstown soils, 15 percent Nassau soils, and 40 percent other soils.

The gently sloping to steep Bernardston soils are on hillsides, ridges, and rolling interridge areas where bedrock is at a depth of more than 5 feet. These soils are deep and well drained and have a fragipan in the substratum at a depth of 15 to 30 inches. The rate of water movement is moderate in the surface layer and subsoil and slow in the fragipan. The pan restricts roots, and a seasonal high water table is perched above the pan for very brief periods in spring.

The gently sloping and sloping Pittstown soils are on hilltops, lower parts of hillsides, and ridges. The soils are deep and moderately well drained and have a fragipan in the substratum at a depth of 15 to 30 inches. The rate of water movement is moderate in the surface layer and subsoil and slow in the fragipan. A seasonal high water table is perched above the pan in winter and spring. The dense pan also restricts roots. In some places, large stones and boulders are on the surface.

The undulating to hilly Nassau soils are on the tops and sides of ridges and hills and in rolling areas between larger hills. The soils are shallow and somewhat excessively drained. Folded and tilted shale and slate are at a depth of 10 to 20 inches. The rate of water movement is moderate. Scattered exposures of bedrock are visible in places, particularly on crests of ridges and on the top of knolls and hills.

Of minor extent in this map unit are Scriba, Alden, Manlius, Raynham, Hoosic, Teel, and Carlisle soils.

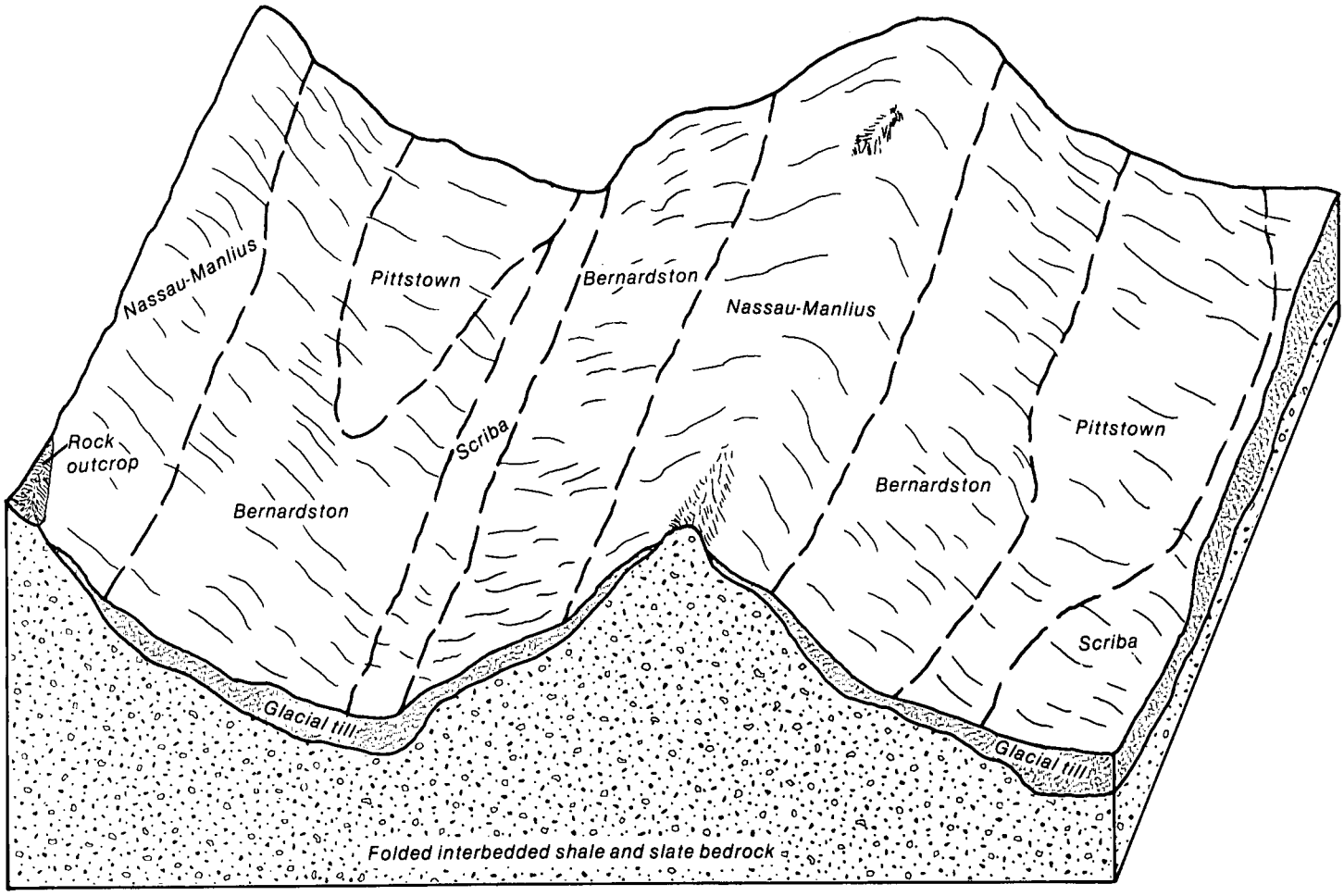


Figure 2.—Typical relationship of soils and underlying material in the Bernardston-Pittstown-Nassau general soil map unit.

Scriba soils are somewhat poorly drained, and Alden soils are very poorly drained; these soils are at lower positions and in depressions that receive runoff from adjacent soils. Manlius soils are similar to Nassau soils but are deeper. Raynham soils are somewhat poorly drained to poorly drained, are in large flat areas, and formed in deep deposits of silt and very fine sand. Hoosic soils are well drained to excessively drained and have much gravel; they are on terraces. Teel soils are moderately well drained to somewhat poorly drained and are on a few flood plains. Carlisle muck is very poorly drained and is in bogs and swamps. In a few places bedrock is exposed at the surface.

Many areas are farmed, but others are idle or wooded. Generally, the soils are suited to crops, hay, and pasture for dairy farms. The irregular topography and steep slope in some areas, seasonal wetness, the shallowness of Nassau soils, and occasional rock outcrops are the main limitations to crop production.

Seasonal wetness in the Pittstown soils, the dense, slowly permeable fragipan in the Bernardston and Pittstown soils, and the shallowness of the Nassau soils limit community development. Some areas are suitable for recreational uses.

2. Buckland-Glover

Dominantly gently sloping to very steep, moderately well drained to somewhat excessively drained, medium textured soils, some of which are deep and have a fragipan and some of which are shallow over sandstone bedrock; on uplands of the grit plateau

These soils formed in glacial till that was derived mainly from sandstone. The landscape is hills and ridges separated by broad undulating and rolling till plains. Sandstone bedrock is exposed in some places and numerous stones and boulders are on the surface. Slope is mainly 8 to 25 percent but ranges from 3 to 50 percent.

This unit makes up about 25 percent of the county. It is 60 percent Buckland soils, 15 percent Glover soils, and 25 percent other soils.

The sloping or moderately steep Buckland soils are on convex hilltops, knolls, ridges, and long hillsides. These soils are deep and well drained to moderately well drained. They have a dense fragipan at a depth of 14 to 22 inches. The rate of water movement is moderate in the surface layer and upper part of the subsoil and slow in the fragipan and substratum. The pan restricts roots. A seasonal high water table is perched above the pan for brief periods in winter and spring.

The sloping or moderately steep Glover soils are on the top of ridges, knolls, and upper parts of hillsides where bedrock is 10 to 20 inches below the surface. These soils are somewhat excessively drained. The rate of water movement through this soil is moderate.

Of minor extent in this map unit are Brayton, Loxley, Beseman, and Hoosic soils. Brayton soils are somewhat poorly drained to poorly drained and are in depressions and along drainageways. Loxley and Beseman are very poorly drained organic soils in bogs and swamps. Hoosic soils are on a few terraces and have a high gravel content. In a few places rock outcrops are common, and in some areas bedrock is 20 to 60 inches below the surface.

Most areas of this unit are forested. There are scattered clear areas that are farmed part time. The soils are not well suited to farming. The growing season is very short and numerous surface stones and boulders interfere with equipment use.

The dense fragipan and seasonal wetness in the Buckland soils and shallowness of the Glover soils seriously limit community development.

3. Bernardston-Albrights-Pittstown

Dominantly gently sloping to steep, well drained and moderately well drained, medium textured, deep soils that have a fragipan; on uplands

The soils in this unit formed in shaly glacial till. The landscape is broad sloping hilltops, hillsides, and tops of broad ridges. Slope is mainly 3 to 25 percent but ranges from 3 to 40 percent.

This unit makes up about 10 percent of the county. It is about 40 percent Bernardston soils, 20 percent Albrights soils, 20 percent Pittstown soils, and 20 percent other soils.

The gently sloping to steep Bernardston soils are on hillsides, ridges, and rolling areas between large hills. These soils are deep and well drained and have a dense fragipan at a depth of 15 to 30 inches. The rate of water movement is moderate in the surface layer and the upper part of the subsoil and slow in the fragipan and substratum. The pan restricts roots. A seasonal high water table is perched above the pan for very brief periods in spring.

The gently sloping to steep Albrights soils are on hilltops, hillsides, and ridges. These soils are deep and moderately well drained and have a dense fragipan at a depth of 18 to 30 inches. The rate of water movement is moderate in the surface layer and upper part of the subsoil and moderately slow in the fragipan and substratum. The water table is perched above the pan for varying periods in winter and spring. In some areas, large stones and boulders are on the surface.

The gently sloping to moderately steep Pittstown soils are on hilltops, lower parts of hillsides, and rolling or undulating areas between hills. These soils are deep and moderately well drained and have a fragipan at a depth of 15 to 30 inches. The rate of water movement is moderate in the surface layer and the upper part of the soil and slow in the fragipan and the substratum. The dense pan restricts roots, and the water table is perched above the pan for brief periods in winter and spring. In some places, large stones and boulders are on the surface.

Of minor extent in this map unit are Scriba, Alden, and Nassau soils. Scriba soils are somewhat poorly drained and are in low areas adjacent to the Pittstown soils. Alden soils are very poorly drained and are in depressions, drainageways, and wet flats. Nassau soils are shallow over folded shale bedrock and are generally on ridgetops.

Some areas of this unit are farmed, and other areas are wooded or are idle. Generally, the soils are suited to crops, hay, and pasture for dairy farms. Seasonal wetness, the dense fragipan, and in some areas steep slope or numerous large stones on the surface limit crop production. Drainage of wet spots improves the suitability of many areas for crops.

Seasonal wetness, slow permeability, and in some places steep slope and numerous stones and boulders seriously limit community development.

4. Macomber-Taconic

Dominantly gently sloping to very steep, well drained and somewhat excessively drained, medium textured soils that are moderately deep or shallow over slate, phyllite, or shale bedrock; on uplands of the Taconic Mountains

These soils formed in glacial till that was derived mainly from slate, phyllite, and shale. This unit is at the higher elevations in the county. The landscape consists of high steep ridges, hills, and mountainsides that are dissected by deep, narrow valleys. In many places bedrock is exposed at the surface. The slope is dominantly 8 to 50 percent but ranges from 3 to 60 percent.

This unit makes up about 5 percent of the county. It is 50 percent Macomber soils, 20 percent Taconic soils, and 30 percent other soils.

The sloping to very steep Macomber soils are on hilltops, ridges, broad benches, and sides of hills and

mountains. These soils are moderately deep and well drained and have a high content of slate and phyllite fragments. Folded bedrock is at a depth of 20 to 40 inches. The rate of water movement through the soil is moderate.

The sloping to very steep Taconic soils are on hilltops, ridgetops, and steep sides of hills and mountains. These soils are shallow and somewhat excessively drained to well drained, and they have a high content of slate, shale, and phyllite fragments. Folded bedrock is at a depth of 10 to 20 inches. The rate of water movement is moderate to moderately rapid throughout the soil.

Of minor extent in this map unit are Loxley, Beseman, Bernardston, Pittstown, Scriba, and Alden soils. Loxley and Beseman mucks are in low bogs and swamps. Bernardston soils are well drained, and Pittstown soils are moderately well drained; these soils are on knolls and side slopes where depth to bedrock is more than 60 inches. Scriba soils are somewhat poorly drained and are along some drainageways. Alden soils are very poorly drained and are in a few depressions. Rock outcrops make up as much as 10 percent of some areas.

This unit is mostly forested and provides habitat for wildlife. Timber production is the main use. The soils in this unit are generally not suitable for farming because of the cold climate and short growing season. Many areas have steep slope, shallow depth to bedrock, and numerous outcrops that also seriously limit farming as well as community development. The gently sloping areas are difficult to use because they are inaccessible.

Areas Dominated by Soils That Formed in Glacial Lake Sediment

The soils in this group make up seven percent of the county. These soils formed in silty and clayey lacustrine material that is mostly free of gravel. These soils are mostly moderately well drained and somewhat poorly drained. Many areas are used for farming, particularly where slope is favorable. The more sloping areas are forested or idle. Some places have been developed for urban uses.

5. Hudson-Rhinebeck

Dominantly nearly level to steep, moderately well drained and somewhat poorly drained, medium textured, deep soils; on the Hudson Valley lake plain

These soils formed in silty and clayey glacial lake deposits. The landscape is a broad plain above the Hudson River; the plain is dissected by a series of small streams that have formed deep ravines. Slope ranges from 0 to 45 percent.

This unit makes up about 7 percent of the county. It is about 50 percent Hudson soils, 20 percent Rhinebeck soils, and 30 percent other soils.

The gently sloping to steep Hudson soils are in undulating and rolling areas of the lake plain and along the steeper side slopes parallel to small tributary streams. These soils are deep and moderately well drained and have a fine textured subsoil. The rate of water movement is moderate or moderately slow in the surface layer and very slow or slow in the subsoil and substratum. A high water table is perched in the subsoil during winter and for short periods in spring.

The nearly level or gently sloping Rhinebeck soils are at slightly lower positions on the lake plain than the Hudson soils. These soils are deep and somewhat poorly drained and have a fine textured subsoil. The rate of water movement is moderately slow in the surface layer and slow in the subsoil. A high water table is perched in the upper part of the subsoil in spring and during prolonged wet periods.

Of minor extent in this unit are Madalin, Unadilla, Elmridge, Shaker, Scio, Raynham, Teel, Carlisle, and Palms soils. Madalin soils are poorly drained and very poorly drained. Unadilla soils are well drained and have more silt and less clay in the subsoil. Elmridge soils are moderately well drained and are on gently sloping terraces. Shaker soils are poorly drained and are in low areas. Scio soils are moderately well drained, and Raynham soils are poorly drained to somewhat poorly drained; these soils are in low areas in silty deposits. Teel soils are moderately well drained to somewhat poorly drained and are on small flood plains along streams. Carlisle and Palms soils are very poorly drained and are in low bogs and swampy areas.

Many areas of this map unit are farmed (fig. 3). Some areas are in woodland and some are idle. The Hudson soils can be quite productive, but they erode easily in sloping areas. Rhinebeck soils are difficult to till unless drained. Tilling these soils at the proper soil moisture content is important to prevent surface clodding and crusting.

Seasonal wetness, slow permeability, and the hazard of slips and slides in steeper areas seriously limit community development.

Areas Dominated by Soils That Formed in Glacial Outwash

The soils in this group make up about 11 percent of the county. These soils formed mainly in gravelly or sandy glacial outwash. They are primarily on valley terraces and outwash plains. Slope is mostly nearly level to hilly except along terrace fronts and in dissected areas, where it ranges to steep. These soils are mostly well drained to excessively drained. Many areas of these soils are used for crops grown on dairy farms. The soils generally are well suited to irrigated crops. Some areas are used for residential developments.

Figure 3.—Typical area of the Hudson-Rhinebeck general soil map unit. Many areas of these soils are used for crops.

6. Hoosic-Chenango

Dominantly nearly level to hilly, excessively drained to well drained, moderately coarse textured and medium textured, deep soils; on outwash plains and in valleys

These soils formed in glacial outwash that has a high content of gravel and sand. The landscape is a series of terraces, benches, knolls, ridges, and broad, nearly flat areas. Slope is mainly 3 to 25 percent but ranges from 0 to 40 percent.

This unit makes up about 7 percent of the county. It is about 50 percent Hoosic soils, 15 percent Chenango soils, and 35 percent other soils.

The nearly level to steep Hoosic soils are on terraces, outwash plains, and low hills and ridges that have complex slopes. These soils are deep and excessively drained to well drained. The subsoil is moderately coarse textured and coarse textured. The rate of water movement is moderately rapid or rapid in the subsoil and very rapid in the substratum. These soils tend to be droughty in summer.

The nearly level or gently sloping Chenango soils are on terraces, alluvial fans, and outwash plains. They are deep and well drained and somewhat excessively drained. The subsoil is medium textured or moderately coarse textured. The substratum is stratified sand and gravel. The rate of water movement is moderate or moderately rapid in the surface layer and subsoil and rapid in the substratum.

Of minor extent in this unit are Haven, Riverhead, Castile, Fredon, Raynham, Barbour variant, Occum variant, Palms, and Carlisle soils. Haven soils are in a few areas that have a loamy mantle. Riverhead soils have less gravel in the surface layer and subsoil than

Hoosic or Chenango soils. Castile soils are moderately well drained and Fredon soils are somewhat poorly drained; these soils are on low terraces, along drainageways, and in depressions. Raynham soils are somewhat poorly drained and poorly drained and are on old stream terraces of silty deposits. Barbour variant soils are well drained, and Occum variant soils are moderately well drained; these soils are on flood plains along the Little Hoosic River. Carlisle and Palms soils are very poorly drained and are in low bogs and swampy depressions.

Many areas of this unit are farmed. Some areas are forested or idle, and a sizeable acreage is used for community development. The major soils of this unit are suited to crops, hay, and pasture for dairy farms. Droughtiness is a hazard on these soils, and irrigation is often needed for good crop growth.

Many areas are suitable for community development, but pollution of ground water by septic tank effluent is a hazard because of the rapid water movement through the substratum. These soils are good sources of sand and gravel.

7. Hoosic-Windsor

Dominantly nearly level to hilly, excessively drained to well drained, moderately coarse textured and coarse textured, deep soils; on outwash plains and in valleys

These soils formed in glacial outwash or deltaic deposits that have a high content of sand or gravel. The landscape is a series of nearly flat to rolling terraces or outwash plains occasionally interspersed with terrace fronts, ravines, or valleys that have steep sides. Slope is dominantly 0 to 25 percent but ranges from 0 to 45 percent.

This unit makes up about 4 percent of the county. It is about 45 percent Hoosic soils, 25 percent Windsor soils, and 30 percent other soils.

The nearly level to steep Hoosic soils are on terraces, outwash plains, and low hills and ridges that have complex slopes. These soils are deep and somewhat excessively drained to well drained. The subsoil is moderately coarse textured and coarse textured. The substratum is coarse textured and has a high content of gravel. The rate of water movement is moderately rapid or rapid in the subsoil and very rapid in the substratum. These soils tend to be droughty in summer.

The nearly level to steep Windsor soils are on terraces, outwash plains, and remnant deltas. These soils are deep, excessively drained, and sandy. The rate of water movement is rapid or very rapid in the subsoil and substratum. These soils are droughty in summer.

Of minor extent in this map unit are Unadilla, Scio, Riverhead, Haven, Elmridge, Castile, Fredon, and Raynham soils. Unadilla soils are well drained, and Scio soils are moderately well drained; these soils are in a few areas of deep, silty deposits. Riverhead and Haven soils are in areas that have a loamy mantle overlying sand and gravel. Elmridge soils are moderately well drained and have clayey material 20 to 40 inches below the surface. Castile soils are moderately well drained, and Fredon soils are somewhat poorly drained to poorly drained; these soils are in low, flat areas and slight depressions. Raynham soils are somewhat poorly drained and poorly drained and are in low areas and along drainageways in deep, silty deposits.

This unit is mostly farmed. A few areas are forested, and other areas are idle. These soils are moderately suited to row crops, hay, and pasture for dairy farms. Droughtiness is a hazard, and irrigation often increases crop production.

The major soils in this unit are suitable for some community development uses. Ground water can be polluted by septic tank effluent because of very rapid water movement through the substratum of these soils. Some areas are good sources of sand or gravel.

Areas Dominated by Soils That Formed in Recent Alluvium

The soils in this group make up two percent of the county. The soils formed mainly in silty alluvium. They are on nearly level flood plains adjacent to streams that are subject to periodic overflow. The soils range from well drained to poorly drained. The better drained soils in this group are used intensively for vegetable crops and crops grown on dairy farms. Only a few areas are used for community development.

8. Limerick-Hamlin-Teel

Dominantly nearly level, poorly drained to well drained, medium textured, deep soils; on flood plains

These soils formed in silty alluvium on flood plains adjacent to meandering streams. Slope is mostly less than 2 percent but ranges from 0 to 3 percent.

This unit makes up about 2 percent of the county. It is about 35 percent Limerick soils, 25 percent Hamlin soils, 20 percent Teel soils, and 20 percent other soils.

The nearly level Limerick soils are in low areas, depressions, oxbows, and old channels on flood plains. They are deep and poorly drained. The subsoil is medium textured. The rate of water movement is moderate throughout the soil. The water table is at or near the surface much of the year. These soils are subject to frequent flooding.

The nearly level Hamlin soils are on the higher parts of the flood plain. These soils are deep and well drained. The subsoil is medium textured. The rate of water movement is moderate throughout the soil. A water table is in the substratum briefly during periods of high water flow in the adjacent rivers and streams. In early spring these soils are subject to flooding.

The nearly level Teel soils are in intermediate areas on the flood plains. They are deep and moderately well

drained to somewhat poorly drained. The subsoil is medium textured. The rate of water movement is moderate throughout the soil. There is a high water table in the subsoil in spring and during other periods of high water flow in adjacent rivers and streams. These soils are subject to flooding in spring.

Of minor extent in this map unit are Fredon, Raynham, Madalin, and Hoosic soils and Fluvaquents, Udifluvents, Saprists, and Aquents. Fredon soils are somewhat poorly drained to poorly drained and are on adjacent lowlying sandy and gravelly terraces. Raynham soils are somewhat poorly drained to poorly drained and silty, and Madalin soils are very poorly drained to poorly drained and clayey; these soils are in a few areas adjacent to the flood plains. Hoosic soils are on a few terraces that have deposits of sand and gravel. Fluvaquents and Udifluvents are in some areas immediately adjacent to streams where the soil material is variable because of frequent flooding. Saprists and Aquents are in very low areas that are covered by shallow water throughout most of the year.

Large areas of this unit are used for vegetable crops. Other areas are used for row crops, hay, and pasture for dairy farms.

Flooding and the high water table in Teel and Limerick soils seriously limit community development.

Detailed Soil Map Units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Hudson silt loam, 3 to 8 percent slopes, is one of several phases in the Hudson series.

Some map units are made up of two or more major soils. These map units are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Nassau-Manlius complex, rolling, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Pittstown-Bernardston association, very stony, sloping, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Loxley and Beseman mucks, 0 to 1 percent slopes, is an undifferentiated group in this survey area.

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

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

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

AlB—Albrights silt loam, 3 to 8 percent slopes. This gently sloping soil is on hilltops and convex hillsides in the uplands. It is deep and moderately well drained. The areas are oval or irregular in shape and are generally smaller than 20 acres.

Typically, the surface layer is friable, dark brown silt loam 9 inches thick. The subsoil extends to a depth of 60 inches. The upper part of the subsoil is friable, brown shaly silt loam grading to firm, mottled, reddish brown shaly silty clay loam. Between depths of 19 and 36 inches is a very firm, brittle fragipan of reddish brown shaly silt loam. Below the fragipan, the subsoil is very firm, weak red shaly silt loam.

Included with this soil in mapping are areas of soils that have a surface layer of gravelly silt loam or gravelly

loam and some areas of soils that are mildly alkaline below the fragipan. Spots of Nassau soils, which are shallow, are included in a few areas. Areas of soils that are similar to the somewhat poorly drained Scriba soils are included along drainageways and in seep spots. Also included are areas of Bernardston and Pittstown soils, which have less clay in the subsoil than this Albrights soil. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

A seasonal high water table is perched above the fragipan during wet periods. Depth to the fragipan ranges from 18 to 30 inches. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and moderately slow in it. Available water capacity is moderate. Surface runoff is medium. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and upper part of the subsoil. Depth to bedrock is more than 5 feet.

Most areas of this soil are used for hay, corn, and grain for dairy farms.

This soil is suited to most crops grown in the area. The seasonal high water table, moderate erosion hazard, and dense fragipan limit crop production. Drainage is needed for best crop growth, especially in areas having included wet spots. Standard management practices—such as conservation tillage, cover crops, crop residue incorporated into the soil, tillage at proper moisture content, and crop rotation—improve tilth, maintain organic matter content, and control erosion.

This soil has good suitability for pasture. Restricting grazing during wet periods helps to maintain pasture seedings. Rotational grazing and annual mowing are needed.

Potential productivity for timber is moderately high. Seedlings can be planted by machine. Eastern white pine, European larch, Norway spruce, and white spruce are suitable for planting.

This soil is not suitable for many urban uses because of the seasonal high water table and the moderately slowly permeable fragipan.

The capability classification is IIe.

AlC—Albrights silt loam, 8 to 15 percent slopes. This gently sloping soil is on convex hillsides in the uplands. It is deep and moderately well drained. The areas are oval and are generally smaller than 20 acres.

Typically, the surface layer is friable, dark brown silt loam 9 inches thick. The subsoil extends to a depth of 60 inches. The upper part of the subsoil is friable, brown shaly silt loam grading to firm, mottled, reddish brown shaly silty clay loam. Between depths of 19 and 36 inches is a very firm, brittle fragipan of reddish brown shaly silt loam. Below the fragipan, the subsoil is very firm, weak red shaly silt loam.

Included with this soil in mapping are areas of soils that have a surface layer of gravelly silt loam or gravelly loam and some areas of soils that are mildly alkaline below the fragipan. Spots of Nassau soils, which are shallow, are included in a few areas. Areas of soils that are similar to the somewhat poorly drained Scriba soils are included along drainageways and in seep spots. Also included are areas of Bernardston and Pittstown soils, which have less clay in the subsoil than this Albrights soil. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

A seasonal high water table is perched above the fragipan during wet periods. Depth to the fragipan ranges from 18 to 30 inches. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and moderately slow in it. Available water capacity is moderate. Surface runoff is medium to rapid. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and upper part of the subsoil. Depth to bedrock is more than 5 feet.

Many areas of this soil are used for hay, corn, and grain for dairy farms. Some areas are used for woodland or pasture or are idle.

This soil is suited to most crops grown in the area. The erosion hazard, seasonal high water table, and dense fragipan limit crop production. Drainage is needed for best crop growth, especially in areas having included wet spots. Standard management practices—such as conservation tillage, cross-slope tillage, cover crops, stripcropping, crop residue incorporated into the soil, tillage at proper moisture content, and crop rotation—improve tilth, maintain organic matter content, and control erosion.

This soil is suited to pasture (fig. 4). Restricting grazing during wet periods helps to maintain pasture seedings. Rotational grazing and annual mowing are needed.

Potential productivity for timber is moderately high. Erosion can be a hazard along logging roads, especially on long slopes. Seedlings can be planted by machine. Eastern white pine, European larch, Norway spruce, and white spruce are suitable for planting.

This soil is not suitable for many urban uses because of the seasonal high water table, the slope, and the moderately slowly permeable fragipan.

The capability classification is IIIe.

AlD—Albrights silt loam, 15 to 25 percent slopes. This moderately steep soil is on convex hillsides in the uplands. It is deep and moderately well drained. The areas are rectangular and are generally smaller than 20 acres.

Typically, the surface layer is friable, dark brown silt loam 9 inches thick. The subsoil extends to a depth of 50 inches. The upper part of the subsoil is friable, brown shaly silt loam grading to firm, mottled, reddish brown shaly silt clay loam. Between depths of 19 and 36 inches is a very firm, brittle fragipan of reddish brown shaly silt loam. Below the fragipan, the subsoil is very firm, weak red shaly silt loam.

Figure 4.—Albrights silt loam, 8 to 15 percent slopes, (foreground) is suited to hay and pasture. The less sloping Hamlin silt loam, 0 to 3 percent slopes, in the Poesten Kill valley is suited to intensive crop production.

Included with this soil in mapping are areas of soils that have a surface layer of gravelly silt loam or gravelly loam and some areas of soils that are mildly alkaline below the fragipan. Also included are small areas of Nassau soils, which are shallow, areas where slope is more than 25 percent, and small areas of well drained Bernardston soils, which are not red in the lower part and have less clay in the subsoil than this Albrights soil. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

A water table is perched above the fragipan in spring and during wet periods. Depth to the fragipan ranges from 18 to 30 inches. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and moderately slow in it. Available water capacity is moderate. Surface runoff is rapid. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and upper part of the subsoil. Depth to bedrock is more than 5 feet.

Most areas of this soil are used for pasture. Some areas are wooded or are idle.

This soil is suitable for many crops grown in this area. In areas used for row crops, excessive erosion can be prevented by crop rotation, cover crops, contour plowing, and conservation tillage. Sod crops control erosion and maintain good tilth. Many areas of this soil are better suited to pasture or long-term hay than to cultivated crops. Interceptor drains may be helpful in diverting runoff and seepage.

Overgrazing is a major concern in pasture management. Overgrazing can cause loss of pasture seedings and usually results in erosion. Stocking the proper number of animals per acre, rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is moderately high. Removing brush and planting carefully improve seedling survival. Seedlings have to be planted by hand in some areas. Eastern white pine, European larch, Norway spruce, and white spruce are suitable for planting.

This soil is not suitable for most urban uses because of the dense, moderately slowly permeable fragipan, the perched water table, and the moderately steep slope.

The capability classification is IVe.

AmC—Albrights very stony silt loam, 3 to 15 percent slopes. This gently sloping and sloping soil is on hillsides in the uplands. It is deep and moderately well drained. Large stones are on the surface about 5 to 30 feet apart. The areas are irregularly shaped and are generally larger than 50 acres.

Typically, the surface layer is friable, dark brown silt loam 9 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part of the subsoil is friable, brown shaly silt loam grading to firm, mottled, reddish brown shaly silty clay loam. Between depths of 19 and 36 inches is a very firm, brittle fragipan of reddish brown shaly silt loam. Below the fragipan, the subsoil is very firm, weak red shaly silt loam.

Included with this soil in mapping are areas of soils that are similar to this Albrights soil but that are well drained and a few small areas where this soil does not have stones on the surface. Also included are a few wet spots in low areas and some areas of soils that are mildly alkaline below the fragipan. Also included are small areas of Nassau, Manlius, Bernardston, and Pittstown soils. Nassau soils are shallow, and Manlius soils are moderately deep. Bernardston and Pittstown soils have less clay in the subsoil than this Albrights soil. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

A seasonal high water table is perched above the fragipan in the spring and during other wet periods. Depth to the fragipan ranges from 18 to 30 inches. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is medium to rapid. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and upper part of the subsoil. The lower part of the subsoil is medium acid to neutral. Depth to bedrock is more than 5 feet.

Most areas of this soil are used for pasture or woodland.

This soil is generally not suited to cultivated crops because of the many large stones on the surface.

This soil is suited to pasture. The stones on the surface make annual mowing and reseeding difficult. Rotational grazing helps to prevent overgrazing.

Potential productivity for timber is moderately high. Removing brush and planting carefully improve seedling survival. Seedlings have to be planted by hand because of the many stones on the surface. Eastern white pine, European larch, Norway spruce, and white spruce are suitable for planting.

This soil is limited for urban uses by the perched water table in spring and the moderately slowly permeable fragipan.

The capability classification is VIs.

AmD—Albrights very stony silt loam, 15 to 40 percent slopes. This moderately steep and steep soil is on hillsides in the uplands. It is deep and moderately well drained. Large stones are on the surface about 5 to 30 feet apart. The areas are rectangular and are usually larger than 50 acres.

Typically, the surface layer is friable, dark brown silt loam 9 inches thick. The subsoil extends to a depth of 60 inches. The upper part of the subsoil is friable, brown shaly silt loam grading to firm, mottled, reddish brown shaly silty clay loam. Between depths of 19 and 36 inches is a very firm, brittle fragipan of reddish brown, shaly silt loam. Below the fragipan, the subsoil is very firm, weak red shaly silt loam.

Included with this soil in mapping are areas of soils that are similar to this Albrights soil but that are well drained, a few spots of wet soils in depressions, and areas of soils that are mildly alkaline in the lower part of the subsoil. Also included are small areas of Nassau, Manlius, Bernardston, and Pittstown soils. Nassau soils are shallow, and Manlius soils are moderately deep. Bernardston and Pittstown soils are not as clayey in the subsoil as this Albrights soil. A few small areas of this soil do not have stones on the surface, and some areas have more stones. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

A seasonal high water table is perched above the fragipan for brief periods. Depth to the fragipan ranges from 18 to 30 inches. Rooting depth is limited by the fragipan. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is rapid. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and upper part of the subsoil. Depth to bedrock is more than 5 feet.

Most areas of this soil are used for woodland.

This soil is not suitable for farming. It is too steep and too stony for cultivated crops and generally for pasture, but limited grazing is possible in some areas. Use of farm machinery on these steep slopes is dangerous.

Potential productivity for timber is moderately high. The moderately steep and steep slope hinders the use of harvesting equipment. Erosion is a hazard along skid trails. Selective logging, proper design of logging roads, and use of water bars reduce erosion. Eastern white pine, European larch, Norway spruce, and white spruce are suitable for planting.

This soil has severe limitations for urban uses. The main limitations are the perched water table in spring, steep slope, and the moderately slowly permeable fragipan.

The capability classification is VIIs.

AnA—Alden silt loam, 0 to 3 percent slopes. This nearly level soil is in concave areas between hills in the uplands. It is deep and very poorly drained. The areas are oval or oblong and are 5 to 20 acres in size.

Typically, the surface layer is very dark gray silt loam about 7 inches thick. The mottled subsoil extends to a depth of 40 inches. It is friable, grayish brown silty clay loam in the upper part; firm, gray silty clay loam in the middle part; and firm, olive silt loam in the lower part. The substratum is very firm, olive gravelly silt loam to a depth of 60 inches.

Included with this soil in mapping are small areas of soils that have a thick, mucky surface layer and small areas of Nassau and Scriba soils. Nassau soils are shallow. Scriba soils are somewhat poorly drained and are in slightly higher areas. Also included on flood plains are narrow areas of wet soils that are thin deposits of silty material over gravelly material. Areas of included soils make up about 15 to 25 percent of this map unit and are as large as 3 acres.

In spring and during wet periods, the water table is at or near the surface. During dry periods later in summer, it lowers to a depth of 3 to 4 feet. Permeability is moderately slow in the subsoil. Plant roots are limited mainly to the upper 15 inches, but a few roots penetrate deeper as the water table recedes during summer. Available water capacity is high. Surface runoff is very slow or ponded. Reaction is strongly acid to neutral in the surface layer and medium acid to neutral in the subsoil. Depth to bedrock is more than 5 feet.

Most of the acreage of this soil has a cover of trees, brush, and other plants that are tolerant of wetness. Some areas are used for pasture.

This soil is poorly suited to cultivated crops unless drained. In some places subsurface drainage is feasible, as is openditch drainage, if a suitable outlet can be located.

This soil is suited to limited use for pasture during dry periods or if it is partially drained. Grazing when the soil is wet causes soil compaction and loss of pasture seedings.

Potential productivity for timber is low because of equipment limitations and shallow rooting caused by prolonged wetness. Northern white-cedar and white spruce are suitable for planting.

This soil is not suitable for urban uses because of prolonged wetness. The high water table can flood basements and severely limits the performance of septic tank filter fields.

The capability classification is IVw.

AoA—Alden very stony silt loam, 0 to 3 percent slopes. This nearly level soil is in concave depressions between hills in the uplands. It is deep and very poorly drained. Large stones and boulders are on the surface 5 to 30 feet apart. The areas are oblong and are 10 to 50 acres in size.

Typically, the surface layer is very dark gray silt loam 7 inches thick. The upper part of the subsoil is mottled, friable, grayish brown silty clay loam 5 inches thick. The next 18 inches of the subsoil is firm, mottled, gray silty clay loam, and the lower part is firm, olive silt loam 10 inches thick. The substratum is very firm, olive gravelly silt loam to a depth of 60 inches.

Included with this soil in mapping are small areas of soils that have a thick, mucky surface layer and small areas of Nassau and Scriba soils. Nassau soils are shallow. Scriba soils are somewhat poorly drained and are in higher areas. Also included on flood plains are narrow areas of wet soils that are thin deposits of silty material over gravelly material. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

In spring and during wet periods the water table is at or near the surface. During dry periods late in summer it lowers to about 3 feet below the surface. Permeability is moderately slow in the subsoil. Plant roots are limited mainly to the upper 15 inches, but a few roots extend deeper as the water table recedes. Available water capacity is high. Surface runoff is very slow or is ponded. Reaction is strongly acid to neutral in the surface layer and medium acid to neutral in the subsoil. Depth to bedrock is more than 5 feet.

Most of the acreage of this soil is idle pasture or is covered by brush and weeds.

This soil is not suitable for cultivated crops because of the wetness and the stones on the surface. This soil is suitable for limited pasture during dry periods. Cultivation is generally not possible unless the soil is drained and the large stones are removed.

Potential productivity for timber is low. Excessive wetness severely hinders use of equipment and allows only shallow rooting, so that strong winds can blow trees over.

Urban use is severely limited by the prolonged high water table, which floods basements and saturates septic tank absorption fields.

The capability classification is VIIs.

BeB—Bernardston gravelly silt loam, 3 to 8 percent slopes. This gently sloping soil is on hilltops and hill crests in the uplands. It is deep and well drained. The areas are oval or irregular in shape and are generally smaller than 20 acres.

Typically, the surface layer is friable, brown gravelly silt loam 8 inches thick. The subsoil is friable and extends to a depth of 30 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Included with this soil in mapping are small areas of Nassau, Manlius, Pittstown, Scriba, and Albrights soils. Nassau soils are shallow, and Manlius soils are moderately deep. Pittstown soils are moderately well drained, and Scriba soils are somewhat poorly drained; these soils are in depressions and wet spots. Albrights

soils have more clay in the subsoil than this Bernardston soil. Also included are areas of soils that have a less dense and less firm substratum, small spots of very gravelly soils, and a few areas of soils that have a mildly alkaline substratum. Near Stephentown are areas of soils that have layers of gravelly fine sandy loam in the subsoil. In some small areas this soil has stones on the surface. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

Early in spring a temporary perched water table is above the fragipan. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate. Runoff is medium. In unlimed areas, reaction is very strongly acid to medium acid. Depth to bedrock is more than 5 feet.

Most areas of this soil are used for hay, corn, and grain for dairy farms. Some areas are used for pasture and woodland.

This soil is suited to most crops grown in the area. Erosion is a slight hazard. It can be controlled by standard management practices, such as crop rotation, contour tillage, conservation tillage, cover crops, and crop residue incorporated into the soil. These practices also improve tilth and maintain organic matter content.

This soil is well suited to pasture. Preventing overgrazing helps to maintain seedings and prevent erosion. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity of timber on this soil is moderate. Removing brush and weeds improves seedling survival. Trees can be planted by machine in many areas. Eastern white pine, Norway spruce, white spruce, Scotch pine, and European larch are suitable for planting.

Many urban uses are limited by the temporary perched water table and the slowly permeable fragipan.

The capability classification is IIe.

BeC—Bernardston gravelly silt loam, 8 to 15 percent slopes. This sloping soil is on hillsides and hilltops in the uplands. In some areas it is on long, cigar-shaped hills. This soil is deep and well drained. The areas are elongated and are generally smaller than 25 acres.

Typically, the surface layer is friable, brown gravelly silt loam 8 inches thick. The subsoil is friable and extends to a depth of 30 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Included with this soil in mapping are small areas where the surface layer is eroded and is less than 6 inches thick. Also included are areas of Nassau, Manlius, Pittstown, Scriba, and Albrights soils. Nassau soils are shallow, and Manlius soils are moderately deep. Pittstown soils are moderately well drained, and Scriba soils are somewhat poorly drained; these soils are in depressions and low areas. Albrights soils have more clay in the subsoil than this Bernardston soil. Also commonly included are areas of soils that have a less dense and less firm substratum, small deposits of watersorted sand and gravel at the southern end of elongated hills, and some areas of soils that have a mildly alkaline substratum. Near Stephentown are areas of soils that have layers of gravelly fine sandy loam in the subsoil. In some small areas this soil has stones on the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Early in spring, a water table is perched above the fragipan for short periods. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Runoff is medium to rapid. In unlimed areas, reaction is very strongly acid through medium acid. Depth to bedrock is more than 60 inches.

Most of the acreage of this soil is used for hay, corn, and grain for dairy farms. Some areas are used for pasture and woodland.

This soil is suited to most crops grown in the area. Erosion is a moderate to severe hazard. It can be controlled by standard management practices, such as contour tillage, stripcropping, conservation tillage, crop rotation, cover crops, and crop residue incorporated into the soil. These practices also improve tilth and maintain organic matter content.

This soil is well suited to pasture. Preventing overgrazing helps to maintain seedings and prevent erosion. Rotational grazing, annual mowing, and applications of lime and fertilizer are needed.

Potential productivity for timber is moderate. Removing brush and weeds improves seedling survival. Trees can be planted by machine in many areas. Eastern white pine, Norway spruce, white spruce, Scotch pine, and European larch are suitable for planting.

Most urban uses are limited by slope, the perched water table, and the slowly permeable fragipan.

The capability classification is IIIe.

BeD—Bernardston gravelly silt loam, 15 to 25 percent slopes. This moderately steep soil is on hillsides and elongated cigarshaped hills in the uplands. It is deep and well drained. The areas are oblong and are generally smaller than 20 acres.

Typically, the surface layer is friable, brown gravelly silt loam 8 inches thick. The subsoil is friable and extends to a depth of 30 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Included with this soil in mapping are small areas where the surface layer is eroded and is less than 6 inches thick. Also included are small areas of Pittstown, Nassau, Manlius, and Albrights soils. Pittstown soils are moderately well drained and are in low areas. Nassau soils are shallow, and Manlius soils are moderately deep. Albrights soils have more clay in the subsoil than this Bernardston soil. In places, bedrock is exposed at the surface. Small deposits of watersorted sand and gravel are commonly included at the southern end of elongated hills. Also included are some areas of soils that have a mildly alkaline substratum. Near Stephentown are areas of soils that have layers of gravelly sandy loam in the subsoil. Some small areas of this soil have stones on the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Early in spring, a water table is perched above the fragipan for very short periods. Rooting depth is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Runoff is rapid. In unlimed areas, reaction is very strongly acid through medium acid. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for hay or pasture on dairy farms. Other areas are idle or are used for woodland.

This soil is suited to small grains in rotation with hay. Erosion is a severe hazard, and the moderately steep slope makes operation of farm machinery dangerous. A rotation that includes long-term hay crops and standard management practices—such as contour tillage or contour stripcropping, conservation tillage, cover crops, and crop residue incorporated into the soil—improve tilth, maintain organic matter content, and control erosion.

This soil is suited to pasture. Preventing overgrazing helps to maintain seedings and prevent erosion. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for woodland is moderate. Erosion is a hazard along logging roads because of the moderately steep slope. Slope also hinders use of equipment. Removing brush and weeds improves seedling survival. Eastern white pine, Norway spruce, white spruce, Scotch pine, and European larch are suitable for planting.

This soil is not suitable for urban uses because of the moderately steep slope, the perched water table early in spring, and the slowly permeable fragipan.

The capability classification is IVe.

BeE—Bernardston gravelly silt loam, 25 to 35 percent slopes. This steep soil is on hillsides and sides of drainageways. It is deep and well drained. The areas are elongated and are generally smaller than 20 acres.

Typically, the surface layer is friable, brown gravelly silt loam 8 inches thick. The subsoil is friable and extends to a depth of 30 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown loam.

Included with this soil in mapping are areas where the surface layer is eroded and is less than 3 inches thick. Also included are areas of Nassau, Manlius, and Albrights soils. Nassau soils are shallow, and Manlius soils are moderately deep. Albrights soils have more clay in the subsoil than this Bernardston soil, and the subsoil is reddish brown. In places are small, scattered outcrops of bedrock. Small deposits of watersorted sand and gravel are commonly included at the southern end of elongated hills. Also included are some areas of soils that have a mildly alkaline substratum. Near Stephentown are areas of soils that have layers of gravelly fine sandy loam in the subsoil. Some small areas of this soil have stones on the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Early in spring and during prolonged wet periods, water is perched above the fragipan for very short periods. Rooting depth is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Surface runoff is rapid to very rapid. In unlimed areas, reaction is very strongly acid through medium acid. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture or woodland or are idle.

This soil is not suitable for cultivated crops or hay. Erosion is a very severe hazard, and use of farm machinery is severely limited by the steep slope.

This soil is generally suited to pasture. Preventing overgrazing helps to lessen the erosion hazard and maintain sod cover. This soil is difficult to manage for pasture because of the steep slope.

The potential productivity for woodland is moderate. Slope moderately hinders use of equipment for planting and harvesting. Running skid trails and logging roads on the contour reduces the severe erosion hazard. Eastern white pine, Norway spruce, white spruce, Scotch pine, and European larch are suitable for planting.

This soil is unsuitable for urban uses because of the steep slope, the perched water table in spring, and the slowly permeable fragipan.

The capability classification is VIe.

BfC—Bernardston very stony silt loam, 3 to 15 percent slopes. This gently sloping to sloping soil is on the western foot slopes of the grit plateau and in rolling areas on the uplands. It is deep and well drained. Large stones are on the surface about 5 to 30 feet apart. The areas are oval to elongated and are as large as 75 acres.

Typically, the surface layer is friable, brown gravelly silt loam 8 inches thick. The subsoil extends to a depth of 30 inches. The upper part of the subsoil is friable, yellowish brown gravelly silt loam, and the lower part is dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Included with this soil in mapping are small areas of Pittstown, Scriba, Nassau, Manlius, and Albrights soils. Pittstown soils are moderately well drained. Scriba soils are somewhat poorly drained and are in depressions and drainageways. Nassau soils are shallow, and Manlius soils are moderately deep. Albrights soils have a reddish brown subsoil that contains more clay than this Bernardston soil. Also included are small areas of soils that have a mildly alkaline substratum. Near Stephentown are areas of soils that have layers of gravelly fine sandy loam in the subsoil. In some small areas this soil does not have stones on the surface, and in some areas the soil is extremely stony. Areas of included soils make up 20 to 30 percent of this map unit and are as large as 3 acres.

Early in spring a water table is perched above the fragipan for very brief periods. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate. Surface runoff is medium. In unlimed areas, reaction is very strongly acid through medium acid. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland.

This soil is generally not suitable for cultivation because of the many large stones on the surface. This soil is suitable for pasture.

Potential productivity for timber is moderate. The use of planting equipment is hindered by the large stones on the surface. Eastern white pine, Scotch pine, Norway spruce, white spruce, and European larch are suitable for planting.

Urban uses are limited by slope, the perched water table, and the slowly permeable fragipan.

The capability classification is VIs.

BfD—Bernardston very stony silt loam, 15 to 40 percent slopes. This moderately steep to steep soil is on the steeper side slopes along the western edge of the grit plateau and in rolling areas on the uplands. Some areas of this soil are on the sides of cigarshaped hills and on valley sides. This soil is deep and well drained. Large stones are on the surface about 5 to 30 feet apart. The areas are elongated, oval, or irregular and are as large as 75 acres.

Typically, the surface layer is friable, brown gravelly silt loam 8 inches thick. The subsoil extends to a depth of 30 inches. The upper part of the subsoil is friable, yellowish brown gravelly silt loam, and the lower part is friable, dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Included with this soil in mapping are small areas where the surface layer is eroded and is thinner than typical. Also included are areas of Pittstown, Scriba, Nassau, Manlius, and Albrights soils. Pittstown soils are moderately well drained and are less sloping. Scriba soils are somewhat poorly drained and are in depressions and drainageways. Nassau soils are shallow, and Manlius soils are moderately deep. Albrights soils have a reddish brown subsoil that contains more clay than this Bernardston soil. Also included are some areas of soils that have a mildly alkaline substratum. Near Stephentown are areas of soils that have layers of gravelly fine sandy loam in the subsoil. Some small areas of this soil do not have stones on the surface, and some areas are extremely stony. Areas of included soils make up 20 to 25 percent of this map unit and are as large as 3 acres.

Early in spring a water table is perched above the fragipan for short periods. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate. Surface runoff is rapid to very rapid. In unlimed areas, reaction is very strongly acid through medium acid. Depth to bedrock is greater than 60 inches.

Most areas of this soil are used for woodland.

This soil is not suitable for cultivation or for pasture because of the steep slope and the many large stones on the surface.

Potential productivity for woodland on this soil is moderate. Eastern white pine, Scotch pine, Norway spruce, white spruce, and European larch are suitable for planting.

This soil is poorly suited to most urban uses because of the steep slope, perched water table in spring, and slowly permeable fragipan.

The capability classification is VIIs.

BnB—Bernardston-Nassau complex, undulating. The soils in this complex are on uplands where the topography is controlled by the underlying folded shale and slate bedrock. Slope ranges from 1 to 8 percent. The Bernardston soil is well drained, is more than 60 inches deep over bedrock, and has a fragipan. The Nassau soil is somewhat excessively drained and is less than 20 inches deep over bedrock.

This complex is 45 percent Bernardston soil, 30 percent Nassau soil, and 25 percent other soils. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are long and wide or are irregular in shape. They are as large as 75 acres or more.

Typically, the Bernardston soil has a surface layer of friable, brown gravelly silt loam 8 inches thick. The subsoil extends to a depth of 30 inches. The upper part

of the subsoil is friable, yellowish brown gravelly silt loam, and the lower part is brown and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Typically, the Nassau soil has a surface layer of very friable, dark brown very shaly silt loam 7 inches thick. The subsoil is friable, yellowish brown very shaly loam to a depth of 15 inches. Folded and fractured shale is below a depth of 15 inches.

Included with these soils in mapping are many areas of Manlius soils and of soils that are similar to the Bernardston soil but that are 40 to 60 inches deep over bedrock. Manlius soils are moderately deep. Also included in low areas, depressions, and seep spots are Pittstown and Scriba soils. Pittstown soils are moderately well drained, and Scriba soils are somewhat poorly drained. In some areas, the soils are red and have more clay than is usual for Bernardston or Nassau soils. Near Stephentown are areas of soils that have a gravelly fine sandy loam subsoil. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

In the Bernardston soil a seasonal high water table is perched above the fragipan early in spring. Permeability is moderate above the fragipan and slow in it. Permeability is moderate in the Nassau soil. Depth to bedrock is 10 to 20 inches in the Nassau soil and more than 60 inches in the Bernardston soil. Rooting depth is restricted by the fragipan in the Bernardston soil and by the bedrock in the Nassau soil. Available water capacity is moderate in the Bernardston soil and very low to low in the Nassau soil. Surface runoff is medium on both soils. In unlimed areas, reaction is very strongly acid to medium acid in the Bernardston soil and very strongly acid or strongly acid in the Nassau soil.

Most areas of this complex are used for corn, hay, and pasture. Some areas are used for woodland or are idle.

These soils are suited to corn, small grains, and hay (fig. 5). The Nassau soil is droughty because bedrock is close to the surface. Erosion is a moderate hazard if these soils are cultivated. Contour tillage is not always feasible because of the undulating topography. Standard management practices—such as crop rotation, conservation tillage, cover crops, and crop residue incorporated into the soil—control erosion and maintain organic matter content.

These soils are well suited to pasture. Overgrazing can weaken the sod cover and increase erosion, especially on the droughty Nassau soil. Maintenance of desirable plant species, rotational grazing, annual mowing, and applications of lime and fertilizer are needed.

The potential productivity for woodland is moderate on the Bernardston soil and low on the Nassau soil. Windthrow is a moderate hazard and seedling mortality is severe on the Nassau soil, mainly because it is shallow. Controlling brush and weeds improves seedling survival. Droughtiness of the Nassau soil slows seedling growth. Norway spruce, white spruce, European larch, eastern white pine, Scotch pine, and red pine are suitable for planting.

These soils have limitations for many urban uses. The slowly permeable fragipan in the Bernardston soil and the shallowness of the Nassau soil severely limit use for septic tank filter fields.

The capability classification is IIe.

BnC—Bernardston-Nassau complex, rolling. The soils of this complex are on uplands where the surface topography is controlled by the underlying folded shale and slate bedrock. Slope ranges from 5 to 16 percent. Texture of the surface layer ranges from gravelly loam to very shaly silt loam. The Bernardston soil is well drained, is more than 60 inches deep over bedrock, and has a fragipan. The Nassau soil is somewhat excessively drained and is less than 20 inches deep over bedrock.

This complex is 45 percent Bernardston soil, 35 percent Nassau soil, and 20 percent other soils. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are long and wide and rectangular. They are as large as 50 acres or more.

Typically, the Bernardston soil has a surface layer of friable, brown gravelly silt loam 8 inches thick. The subsoil extends to a depth of 30 inches. The upper part of the subsoil is friable, yellowish brown gravelly silt loam and the lower part is friable, dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Typically, the Nassau soil has a surface layer of very friable, dark brown very shaly silt loam 7 inches thick. The subsoil is friable, yellowish brown very shaly loam to a depth of 15 inches. Folded and fractured shale is below a depth of 15 inches.

Included with these soils in mapping are areas of Manlius, Pittstown, and Scriba soils. Manlius soils are moderately deep. Pittstown soils are moderately well drained, and Scriba soils are somewhat poorly drained; these soils are in depressions and seep spots. Also included are areas of soils that are similar to the Bernardston soils but that are 40 to 60 inches deep over bedrock. In some areas the soils are red and have more clay than is usual for Bernardston or Nassau soils. Near Stephentown are areas of soils that have a gravelly fine sandy loam subsoil. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

In the Bernardston soil a seasonal high water table is perched above the fragipan early in spring. Permeability is moderate above the fragipan and slow in it. Permeability is moderate in the Nassau soil. Depth to bedrock is 10 to 20 inches in the Nassau soil and more

Figure 5.—Bernardston-Nassau complex, undulating, (foreground) is suited to both corn and hay.

than 60 inches in the Bernardston soil. Rooting depth is restricted by the fragipan in the Bernardston soil and by the bedrock in the Nassau soil. Available water capacity is moderate in the Bernardston soil and very low to low in the Nassau soil. Surface runoff is medium to rapid in both soils. In unlimed areas, reaction is very strongly acid through medium acid in the Bernardston soil and very strongly acid or strongly acid in the Nassau soil.

Most areas of this complex are used for corn, hay, and pasture. Some areas are used for woodland or are idle.

This mapping unit is suited to corn, small grains, and hay. The Nassau soil is droughty because bedrock is close to the surface. Erosion is a hazard in unprotected areas. Contour tillage is not always feasible because of the rolling topography. Standard management practices—such as crop rotation, conservation tillage, cover crops, and crop residue incorporated into the soil—control erosion, improve tilth, and maintain organic matter content. Sodforming crops also reduce erosion.

These soils are suited to pasture. Overgrazing can weaken the sod cover, especially on the droughty Nassau soil. Maintenance of desirable plant species, annual mowing, and lime and fertilizer are needed.

The potential productivity for woodland is moderate on the Bernardston soil and low on the Nassau soil. Windthrow is a moderate hazard and seedling mortality is severe on the Nassau soil because it is shallow. Removing brush and weeds improves seedling survival. Norway spruce, white spruce, red pine, eastern white pine, Scotch pine, and European larch are suitable for planting.

These soils have limitations for many urban uses. The slowly permeable fragipan in the Bernardston soil and the shallowness of the Nassau soil severely limit use for septic tank filter fields. The rolling topography is a problem for some uses.

The capability classification is IIIe.

BnD—Bernardston-Nassau complex, hilly. The soils of this complex are in areas on uplands where the surface topography is controlled by the underlying folded shale and slate bedrock. Slope ranges from 10 to 30

percent. Texture of the surface layer ranges from gravelly loam to very shaly silt loam. The Bernardston soil is well drained, is more than 60 inches deep over bedrock, and has a fragipan. The Nassau soil is somewhat excessively drained and is less than 20 inches deep over bedrock.

This complex is 40 percent Bernardston soil, 30 percent Nassau soil, and 30 percent other soils. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are fairly long and wide. They are as large as 40 acres.

Typically, the Bernardston soil has a surface layer of friable, brown gravelly silt loam 8 inches thick. The subsoil extends to a depth of 30 inches. The upper part of the subsoil is friable, yellowish brown gravelly silt loam, and the lower part is friable, dark yellowish brown, brown, and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Typically, the Nassau soil has a surface layer of very friable, dark brown very shaly silt loam 7 inches thick. The subsoil is friable, yellowish brown very shaly loam to a depth of 15 inches. Folded and fractured shale is below a depth of 15 inches.

Included with these soils in mapping are many areas of Manlius soils and of soils that are similar to Bernardston soils but that are 40 to 60 inches deep over bedrock. Manlius soils are moderately deep. Also included in depressions and seep spots are Pittstown and Scriba soils. Pittstown are moderately well drained, and Scriba soils are somewhat poorly drained. In some areas, the soils are red and have more clay than is usual for Bernardston or Nassau soils. Near Stephentown are areas of soils that have a gravelly fine sandy loam subsoil. Areas of included soils make up about 30 percent of this map unit and are as large as 3 acres.

In the Bernardston soil a seasonal high water table is perched above the fragipan early in spring. Permeability is moderate above the fragipan and slow in it. In the Nassau soil the permeability is moderate. Depth to bedrock is 10 to 20 inches in the Nassau soil and more than 60 inches in the Bernardston soil. Rooting depth is restricted by the fragipan in the Bernardston soil and by the bedrock in the Nassau soil. Available water capacity is moderate in the Bernardston soil and very low to low in the Nassau soil. Surface runoff is rapid in both soils. In unlimed areas, reaction is very strongly acid through medium acid in the Bernardston soil and very strongly acid or strongly acid in the Nassau soils.

Most areas of this complex are used for corn, hay, and pasture. Some areas are idle.

The soils in this unit are poorly suited to cultivated crops because of the irregular topography, moderately steep slope, and hazard of erosion. These soils are suitable for hay, which reduces erosion.

These soils are suitable for pasture. Overgrazing can weaken the pasture seedings and increase the hazard of erosion, especially on the droughty Nassau soil. Maintenance of desirable plant species, annual mowing, rotational grazing, and lime and fertilizer are needed.

The potential productivity for woodland is moderate on the Bernardston soil and low on the Nassau soil. Windthrow is a moderate hazard and seedling mortality is severe on the Nassau soil because it is shallow. Use of equipment is hindered by the slope. Running logging roads on the contour and using water bars help to prevent erosion. Removing brush and weeds improves seedling survival. Norway spruce, white spruce, red pine, Scotch pine, eastern white pine, and European larch are suitable for planting.

These soils are not suitable for urban uses because of the moderately steep slope, the shallowness of the Nassau soil, and the slowly permeable fragipan of the Bernardston soil.

The capability classification is IVe.

BoD—Bernardston-Pittstown association, very stony, moderately steep. The soils of this association are on foot slopes of the Taconic Mountains. The Bernardston soils are in convex areas, and the Pittstown soils are in concave areas or slight depressions. The Bernardston soils are slightly steeper than the Pittstown soils, and the Pittstown soils are in lower positions. Slope ranges from 15 to 35 percent but is mainly 15 to 25 percent. The Bernardston soils are deep and well drained; the Pittstown soils are deep and moderately well drained. Many large stones are on the surface 5 to 30 feet apart.

This association is about 60 percent Bernardston soils, 25 percent Pittstown soils, and 15 percent other soils. The areas of this association are irregular in shape and are 10 to 200 acres in size.

Typically, the Bernardston soils have a very friable, brown gravelly silt loam surface layer 8 inches thick. The subsoil extends to a depth of 30 inches. It is yellowish brown gravelly silt loam in the upper part and dark yellowish brown, brown, and dark brown gravelly loam in the lower part. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Typically, the Pittstown soils have a very friable, very dark grayish brown gravelly silt loam surface layer 9 inches thick. The subsoil extends to a depth of 24 inches. The upper part of the subsoil is friable, yellowish brown gravelly silt loam; and the lower part is friable, mottled, light olive brown gravelly silt loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is firm and very brittle, mottled, olive gravelly silt loam.

Included with these soils in mapping are several areas of Hoosic, Taconic, Macomber, and Scriba soils. Taconic soils are shallow, and Macomber soils are moderately

deep. Scriba soils are somewhat poorly drained and are along drainageways and in seep spots. In some small areas, the soils have more clay in the subsoil than is usual for Bernardston or Pittstown soils. Some areas do not have stones on the surface. Areas of included soils make up about 15 percent of this map unit and are as large as 10 acres.

Early in spring and during other excessively wet periods, the water table is temporarily perched above the fragipan in Bernardston and Pittstown soils. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate in both soils. Surface runoff is rapid. Reaction ranges from very strongly acid to medium acid. Depth to bedrock is more than 60 inches.

Most areas of this association are wooded or idle. Some areas are used for unimproved pasture.

These soils are not suitable for cultivation because of the slope, many large stones on the surface, and poor accessibility. Because these soils are at high elevations, they warm late in spring; as a result, the growing season is too short for most of the crops commonly grown at lower elevations.

These soils generally are not suitable for pasture. The steepness increases the hazard of severe erosion if pasture is overgrazed. Poor accessibility and large stones on the surface make management difficult. Overgrazing can be prevented by rotational grazing and stocking the proper number of animals per acre.

The potential productivity for woodland is moderate on the Bernardston soil and moderately high on the Pittstown soil. The steepness of slope hinders use of harvesting equipment. Running logging roads on the contour and using water bars reduce the erosion hazard. European larch, eastern white pine, white spruce, Norway spruce, and Scotch pine are suitable for planting.

These soils are not suitable for urban uses. Poor accessibility, the temporary perched water table in spring, the slowly permeable fragipan, and the slope are the main problems. The hazard of erosion is especially severe in disturbed areas.

The capability classification is VIIs.

BrA—Brayton very stony silt loam, nearly level. This soil is in depressions and drainageways on the grit plateau. Slope ranges from 0 to 3 percent. This soil is deep and is somewhat poorly drained and poorly drained. Many large stones are on the surface about 5 to 30 feet apart. The areas are irregular in shape and are 10 to 75 acres in size.

Typically, the surface layer is friable, very dark grayish brown and dark brown gravelly silt loam about 11 inches thick. The upper part of the subsoil is friable, mottled, grayish brown gravelly loam 3 inches thick; and the lower 3 inches is firm, mottled, light olive brown loam. The substratum is a very firm fragipan of olive brown to yellowish brown gravelly loam that extends to a depth of 60 inches.

Included with this soil in mapping are areas of very poorly drained soils in deep depressions and areas of Buckland soils on knolls and higher spots. Buckland soils are well drained and moderately well drained. Also included are small spots of soils that have a surface layer of loamy sand or of mucky material. Some areas of this soil do not have stones on the surface and some are extremely stony. Some areas have slope as steep as 8 percent. Areas of included soils make up about 15 percent of this map unit and are as large as 10 acres.

In spring and during other wet periods, a high water table is perched above the fragipan. Depth to the top of the fragipan ranges from 13 to 24 inches. Rooting depth is restricted by the fragipan. Permeability is moderate or moderately rapid above the fragipan and slow or very slow in the fragipan. Available water capacity is low to moderate. Runoff is very slow or slow. In unlimed areas, the reaction of the surface layer and upper part of the subsoil is very strongly acid to slightly acid. Depth to bedrock is more than 5 feet.

Most areas of this soil are used for woodland.

This soil is not suitable for row crops. Management for hay and pasture is limited by the large surface stones, seasonal wetness, and a short growing season.

Potential productivity for timber is moderate. Red oak and sugar maple should be favored in existing stands. White spruce, Norway spruce, and eastern white pine are suitable for planting.

This soil is not suitable for urban uses because of the seasonal high water table and the slowly permeable fragipan.

The capability classification is VIIs.

BuC—Buckland very stony loam, sloping. This soil is on uplands on the grit plateau. Slope ranges from 3 to 15 percent. This soil is deep and formed in glacial till. It is moderately well drained in most areas but is well drained in some. Many large stones are on the surface about 5 to 30 feet apart. The areas are irregular in shape and are 30 to 150 acres in size.

Typically, the surface layer is very friable, very dark grayish brown loam 2 inches thick. The subsoil extends to a depth of 60 inches. The upper part is very friable, dark yellowish brown gravelly loam; the middle part is firm, mottled, brown gravelly loam; and the lower part is a very firm, mottled, brown gravelly loam fragipan.

Included with this soil in mapping are areas of Brayton and Glover soils. Brayton soils are somewhat poorly drained and poorly drained. Glover soils are shallow. Some areas of this soil do not have stones on the surface and some are extremely stony. Areas of included soils make up about 25 percent of this map unit and are as large as 10 acres.

Early in spring and during excessively wet periods, a temporary high water table is perched above the

fragipan. Depth to the fragipan ranges from 18 to 36 inches. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Runoff is medium. In unlimed areas, reaction is strongly acid or very strongly acid above the fragipan. Depth to bedrock is more than 60 inches.

A large acreage of this unit is wooded. Some cleared areas are used for pasture.

This soil is generally not suitable for crops unless the stones are removed. Erosion is a moderate hazard if the fields are cleared for cultivation. Also, the growing season is short.

If surface stones are removed, this soil is suited to pasture. Application of lime and fertilizer, maintenance of desirable pasture plants, and annual mowing are recommended, but management is difficult unless the stones are removed.

Potential productivity for timber is moderately high. Use of planting equipment is hindered by the large stones on the surface. Eastern white pine, red pine, Norway spruce, white spruce, and European larch are suitable for planting. This soil is well suited to wildlife habitat.

This soil is not suitable for urban uses. The dense, slowly permeable fragipan and the seasonal high water table limit use for septic tank absorption fields and can cause wet basements. The large stones on the surface make construction and landscaping difficult.

The capability classification is VIs.

BuD—Buckland very stony loam, moderately steep. This soil is on the grit plateau. Slope ranges from 15 to 35 percent. This soil is deep and formed in glacial till. This soil is well drained in most areas but is moderately well drained in some. Many large stones are on the surface about 5 to 30 feet apart. The areas are irregular in shape and are 30 to 150 acres in size.

Typically, the surface layer is very friable, very dark grayish brown loam 2 inches thick. The subsoil extends to a depth of 60 inches. The upper part is very friable, dark yellowish brown gravelly loam; the middle part is firm, mottled, brown gravelly loam; and the lower part is a very firm, mottled, brown gravelly loam fragipan.

Included with this soil in mapping are areas of Brayton and Glover soils. Brayton soils are somewhat poorly drained and poorly drained. Glover soils are shallow. Some areas of this soil are extremely stony. Areas of included soils make up about 15 percent of this map unit and are as large as 10 acres.

Early in spring and during excessively wet periods, a temporary high water table is perched above the fragipan. Depth to the fragipan ranges from 18 to 36 inches. The depth of the root zone is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in the pan. Available water capacity is moderate. Runoff is rapid. In unlimed areas, reaction is strongly acid or very strongly acid in the surface layer and upper part of the subsoil. Depth to bedrock is more than 60 inches.

Most of the acreage of this soil is wooded. Some cleared areas are used for pasture.

This soil is not suitable for cultivation because of the stones on the surface and the steepness. Also, the growing season is short.

If stones are removed from the surface, some areas of this soil can be used for pasture. Overgrazing weakens the sod and increases the erosion hazard. Use of machinery is hindered by the steepness and the stones on the surface.

Potential productivity for timber is moderately high. Properly constructing logging roads and skid trails and using water bars reduce erosion during and after harvest. Eastern white pine, red pine, Norway spruce, white spruce, and European larch are suitable for planting.

This soil is not suitable for urban uses. Steepness, the dense and slowly permeable fragipan, and the seasonal high water table are severe limitations.

The capability classification is VIIs.

BuF—Buckland very stony loam, very steep. This soil is on the grit plateau. Slope ranges from 35 to 50 percent. This soil is deep. It is well drained in most areas but is moderately well drained in some. Large stones and boulders are on the surface about 5 to 30 feet apart. The areas are oval to irregular in shape and are 30 to 150 acres in size.

Typically, the surface layer is very friable, very dark grayish brown loam 2 inches thick. The subsoil extends to a depth of 60 inches. The upper part is very friable, dark yellowish brown gravelly loam; the middle part is firm, mottled, brown gravelly loam; and the lower part is a very firm, mottled, brown gravelly loam fragipan.

Included with this soil in mapping are areas of Brayton and Glover soils. Brayton soils are less sloping and are somewhat poorly drained and poorly drained. Glover soils are shallow. Some areas of this soil are extremely stony. Areas of included soils make up about 25 percent of this map unit and are as large as 10 acres.

Early in spring, a temporary high water table is perched above the fragipan. Depth to the fragipan ranges from 18 to 36 inches. Rooting depth is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate. Runoff is very rapid. In unlimed areas, reaction is strongly acid or very strongly acid above the fragipan. Depth to bedrock is more than 60 inches.

Most of the acreage of this unit is wooded.

This soil is not suitable for cultivation because of slope and the stones on the surface. Erosion is a severe hazard in disturbed or exposed areas. Also, the growing season is short.

This soil is unsuitable for pasture because of the very steep slope and the many stones on the surface. Overgrazing weakens the sod and increases the erosion hazard.

Potential productivity for woodland is moderately high. Use of equipment is severely limited by the slope. Properly constructing logging roads and skid trails and using water bars reduce erosion during and after harvest. Red pine, eastern white pine, Norway spruce, white spruce, and European larch are suitable for planting.

This soil is not suitable for urban uses. The slope, the slowly permeable fragipan, and the seasonal high water table are limitations.

The capability classification is VIIs.

CaA—Carlisle muck, 0 to 1 percent slopes. This nearly level organic soil is in wet bogs and swamps in the glaciated uplands. These depressional areas receive runoff from surrounding areas. This soil is very poorly drained. The areas are irregular in shape and are generally 3 to 40 acres in size.

Typically, the surface layer is black muck 10 inches thick. The subsurface layers extend to a depth of 70 inches; the upper part is slightly plastic and slightly sticky, black muck, the middle part is very dark grayish brown muck, and the lower part is platy, dark olive gray coprogenous earth. The substratum extends to a depth of 100 inches. It is dark gray very fine gravelly loam in the upper part and dark gray gravelly loam to sandy loam in the lower part.

Included with this soil in mapping are small areas of Palms muck and of Madalin soils, which are clayey. Also included are spots of muck soils that are not as well decomposed as this Carlisle soil. In some areas this soil is less than 60 inches deep. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

This soil has a high water table or is ponded most of the year. Rooting depth is restricted by the high water table. Runoff is very slow or is ponded. Permeability is moderately slow to moderately rapid. The available water capacity is high. Reaction is very strongly acid to neutral throughout the organic layers. Depth to bedrock is more than 60 inches.

Most areas of this soil are wooded or have a cover of brush and sedges.

This soil is well suited to cultivation of high-value truck and specialty crops if the soil is drained. If this soil is drained, subsidence and wind erosion are hazards. Subsidence can be reduced by maintaining a high water table between growing seasons. Wind erosion can be reduced by planting windbreaks. Many areas are in frost pockets.

This soil is generally not suitable for pasture. Livestock will puncture and compact the organic surface layer.

Potential productivity for timber is low. The low bearing strength and prolonged high water table hinder use of machinery. Excessive wetness causes high seedling mortality. Many areas of this soil are suited to wetland wildlife habitat (fig. 6).

This soil is not suitable for nonfarm uses. The high water table, high compressibility, and low bearing strength of the organic material are very severe limitations.

The capability classification is IVw.

CbA—Castile gravelly silt loam, 0 to 5 percent slopes. This nearly level to gently sloping soil is in slight depressions. It is deep and moderately well drained. This soil formed in glacial outwash gravel and sand. The areas are irregular in shape and are 5 to 75 acres in size.

Typically, the surface layer is friable, dark brown gravelly silt loam 10 inches thick. The subsoil extends to a depth of 32 inches. The upper part of the subsoil is friable, yellowish brown very gravelly loam; the middle part is very friable, mottled, brown very gravelly sandy loam; and the lower part is friable, mottled, grayish brown very gravelly sandy loam. The substratum is single grained, very dark grayish brown very gravelly sand to a depth of 60 inches.

Included with this soil in mapping are small areas of Chenango, Hoosic, and Fredon soils. Fredon soils are somewhat poorly drained and poorly drained. Also included are areas of soils that have less gravel or are coarser textured than this Castile soil. In small areas, slope is more than 5 percent. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

Early in spring and during other wet periods, the water table is within 24 inches of the surface. Rooting depth is restricted by the water table, but roots extend downward as the water table recedes during late spring. Permeability is moderately rapid in the subsoil and rapid or very rapid in the substratum. Available water capacity is very low to moderate. Surface runoff is slow. Reaction of the surface layer and subsoil is very strongly acid to medium acid. Depth to bedrock is more than 60 inches.

Much of the acreage of this soil is used for crops, hay, or pasture. Some areas are used for woodland.

This soil is suited to most crops grown in the area. The wetness can be reduced by subsurface drainage so that this soil can be worked earlier in spring and following wet periods. Locating adequate outlets for drainage can be a problem because the topography is nearly level. Small stones on the surface interfere with some tillage operations and can cause excessive wear of machinery. Standard management practicessuch as conservation tillage, cover crops, crop residue incorporated into the soil, and crop rotationimprove tilth and maintain organic matter content.

This soil is suited to pasture. The pasture should not be grazed when the soil is wet. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Figure 6.—Many areas of Carlisle muck are ponded much of the year and so are suitable for wildlife marshes.

Potential productivity for woodland is moderately high. There are few management problems. Removing brush and planting carefully improve seedling survival. Eastern white pine, Norway spruce, and European larch are suitable for planting.

This soil is moderately or severely limited for urban uses by the seasonal high water table. Small stones on the surface interfere with some uses. The sidewalls of excavations may cave in during construction.

The capability classification is IIw.

ChA—Chenango very gravelly loam, 0 to 3 percent slopes. This nearly level soil is on outwash plains and terraces. It is deep and is well drained to somewhat excessively drained. The areas are broad and are 3 to 40 acres in size.

Typically, the surface layer is very friable, brown very gravelly loam 7 inches thick. The upper part of the subsoil is friable, dark yellowish brown very gravelly loam about 6 inches thick; and the lower part is friable, dark brown very gravelly loam about 30 inches thick. The upper part of the substratum is dark brown very gravelly loamy sand about 17 inches thick. The lower part of the substratum is very dark grayish brown very gravelly loamy sand.

Included with this soil in mapping are small areas of Castile, Hoosic, Unadilla, and Riverhead soils. Castile soils are moderately well drained, Hoosic soils are well drained to excessively drained, and Unadilla soils are well drained. Also included are areas of Fredon soils in small depressions and Carlisle or Palms muck in very low areas. Fredon soils are somewhat poorly drained to poorly drained. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

This soil may be droughty for short periods in summer. Permeability is moderate or moderately rapid in the subsoil and rapid in the substratum. Available water capacity is very low to moderate. Runoff is slow. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and upper part of the subsoil. Depth to bedrock is more than 60 inches.

Much of the acreage of this soil is used for hay, corn, and grain for dairy farms. A large acreage has been developed for urban uses.

This soil is suited to most crops grown in the area. Droughtiness and small rock fragments are the main limitations for farming. Irrigation can increase crop yields. Gravel and cobblestones can cause excessively rapid wear of farm machinery. Conservation tillage, cover crops, crop residue returned to the soil, and crop rotation improve fertility, tilth, and available water capacity.

This soil is suitable for pasture. Droughtiness is the main limitation. Preventing overgrazing helps to maintain seedings. Rotational grazing and stocking the proper number of animals per acre are important.

Potential productivity for timber is high. Droughtiness and plant competition are the principal limitations. Removing brush and planting early in spring help to insure seedling survival. Eastern white pine, red pine, and European larch are suitable for planting.

This soil is suited to most urban uses. Small stones interfere with many uses, such as landscaping and establishing lawns. Effluent from septic systems can pollute ground water because water moves rapidly through the substratum of this soil. This soil is a probable source of sand and gravel.

The capability classification is IIs.

ChB—Chenango very gravelly loam, 3 to 8 percent slopes. This gently sloping soil is in undulating areas on outwash plains and terraces. It is deep and is well drained to somewhat excessively drained. The areas are broad and are 3 to 50 acres in size.

Typically, the surface layer is very friable, brown very gravelly loam about 7 inches thick. The upper part of the subsoil is friable, dark yellowish brown very gravelly loam about 6 inches thick; and the lower part is friable, dark brown very gravelly loam about 30 inches thick. The upper part of the substratum is dark brown very gravelly loamy sand about 17 inches thick. The lower part of the substratum is very dark grayish brown, very gravelly loamy sand.

Included with this soil in mapping are small areas of Castile, Hoosic, Unadilla, and Riverhead soils. Castile soils are moderately well drained, Hoosic soils are well drained to excessively drained, and Unadilla soils are well drained. Also included are areas of Fredon soils in small depressions and Carlisle or Palms muck in very low areas. Fredon soils are somewhat poorly drained to poorly drained. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

This soil may be droughty for short periods in summer. Permeability is moderate or moderately rapid in the subsoil and rapid in the substratum. Available water capacity is very low to moderate. Runoff is medium. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and upper part of the subsoil. The depth to bedrock is more than 60 inches.

Much of the acreage of this soil is used for hay, corn, and grain for dairy farms. A considerable acreage has been developed for urban uses.

This soil is suited to most crops grown in the county. Droughtiness and small rock fragments are the main limitations for farming. Irrigation can increase crop yields, but the gentle slopes create a problem in applying water and increase the hazard of erosion. This soil is more difficult to irrigate than the nearly level Chenango soil. Gravel and cobblestones can cause excessive wear of farm machinery. Conservation tillage, contour plowing, cover crops, crop rotation, and crop residue returned to the soil improve fertility, tilth, and moisture content.

This soil is suitable for pasture. Droughtiness is the main limitation. Overgrazing can increase the erosion hazard. Rotational grazing and stocking the proper number of animals per acre are important.

Potential productivity for timber is high. Droughtiness and plant competition are the principal limitations. Removing brush and planting seedlings early in spring help to insure survival. Erosion is a hazard along logging roads built on long slopes. Eastern white pine, red pine, and European larch are suitable for planting.

This soil is suited to most urban uses but may require more grading than the nearly level Chenango soil. Small stones interfere with many uses, such as landscaping and establishing lawns. Effluent from septic systems can pollute the ground water because water moves rapidly through the substratum of this soil. This soil is a probable source of sand and gravel.

The capability classification is IIs.

CkB—Chenango gravelly loam, fan, 3 to 8 percent slopes. This gently sloping soil is in major valleys. It formed in gravelly material deposited by side streams. This soil is deep and is well drained to excessively drained. The areas are irregular or fan shaped and are 3 to 30 acres in size.

Typically, the surface layer is very dark grayish brown gravelly loam 10 inches thick. The upper part of the subsoil is dark brown sandy loam 5 inches thick; and the lower part is dark brown very gravelly fine sandy loam about 9 inches thick. The substratum is loose, dark brown very gravelly loamy sand.

Included with this soil in mapping are small areas of Hoosic, Castile, and Fredon soils. Hoosic soils are well drained to excessively drained, Castile soils are moderately well drained, and Fredon soils are somewhat poorly drained to poorly drained. Fredon soils are in depressions and along stream channels. In some areas slope is as much as 12 percent. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

This soil can be droughty. Permeability is moderate to rapid in the subsoil and rapid in the substratum. The water table may rise to within 3 to 6 feet of the surface in spring, and the soil is subject to rare flooding.

Available water capacity is very low to moderate. Runoff is medium. In unlimed areas, reaction is strongly acid or very strongly acid in the surface layer and very strongly acid to medium acid in the subsoil. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for hay, corn, grain, and pasture for dairy farms.

This soil is suited to most crops grown in the area. Small rock fragments interfere with some tillage and seeding operations and may cause excessive wear of machinery. Droughtiness is a limitation in midsummer. Standard management practices—such as conservation tillage, cover crops, crop rotation, cross-slope tillage, and crop residue incorporated into the soil—improve tilth, conserve moisture, and maintain organic matter content. These practices also reduce the hazard of erosion.

This soil is suitable for pasture. The main limitation is droughtiness. Rotational grazing and annual mowing help to maintain high quality seedings.

Potential productivity for timber is high. Planting seedlings when the soil is moist in spring insures survival. Growth of seedlings may be slowed by droughtiness and plant competition. Eastern white pine, Norway spruce, and European larch are suitable for planting.

Rare flooding, rapid permeability, a water table less than 6 feet below the surface early in spring, and many small rock fragments limit many urban uses. This soil is a probable source of sand and gravel.

The capability classification is IIs.

Du—Dumps, landfill. This map unit consists of sanitary landfills, dumps, and other sites that have been used for the disposal of trash and rubble. The material deposited in these areas is generally not soil. In normal practice, an excavation is made, refuse is dumped and spread in a layer, and the area is covered with a layer of soil material. There are generally several successive layers of refuse and compacted soil material. Cover material used on these sites is commonly loamy and has less than 20 percent rock fragments. Because of the variability of material in the disposal site, differential settling is common in the filled trenches.

Areas that have been covered for the final time and abandoned as active dumping sites are included in this map unit.

Because of the variability of deposited refuse and cover material, permeability, available water capacity, tilth, and other properties vary considerably. At some sites, methane and hydrogen sulfide gases are produced by the decomposition of organic refuse.

Onsite investigation is needed to determine the potential of any area for various uses. Properly covered and graded areas can often be used for hay, pasture, timber, or recreation.

No capability classification is assigned.

ElB—Elmridge very fine sandy loam, 3 to 8 percent slopes. This gently sloping soil is on smooth areas on the dissected lake plain. This soil is deep and moderately well drained. The areas are irregular in shape and are generally 3 to 25 acres in size.

Typically, the surface layer is friable, dark grayish brown very fine sandy loam 9 inches thick. The subsoil extends to a depth of 36 inches. The upper part of the subsoil is friable, yellowish brown fine sandy loam; and the lower part is friable, mottled, dark yellowish brown fine sandy loam. The substratum is firm, olive brown and brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Shaker and Windsor soils. Shaker soils are poorly drained. Windsor soils are deep, sandy, and excessively drained, and they are on knolls. Also included are spots of soils that are similar to this Elmridge soil but that are well drained, soils that have a very fine sandy loam subsoil, and soils that are neutral or mildly alkaline in the underlying clay. In some areas this soil is nearly level. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

In spring and during other wet periods, a perched water table is at a depth of 18 to 36 inches. The clayey substratum restricts downward movement of water and roots. Permeability is moderately rapid in the subsoil and slow or very slow in the substratum. Available water capacity is moderate to high. Runoff is medium. In unlimed areas, the reaction is strongly acid or medium acid throughout the soil. Depth to bedrock is more than 60 inches.

This soil is used mainly for cultivated crops, hay, and pasture. Some of the acreage is idle.

This soil is suited to farming and is used for silage corn in rotation with hay and pasture. Erosion is a moderate hazard if the soil is cultivated and not protected by conservation practices. Subsurface drainage is needed in places to eliminate wetness that interferes with management and reduces production.

This soil is suited to pasture. Proper seeding rates, rotational grazing, annual mowing, and application of lime and fertilizer increase pasture yields.

Potential productivity for timber is moderately high. Eastern white pine, white spruce, Norway spruce, and European larch are suitable for planting.

This soil has limitations for nonfarm uses. The slow or very slow permeability in the substratum and the seasonal high water table severely limit use for septic tank absorption fields.

The capability classification is IIw.

FlA—Fluvaquents-Udifluvents complex, 0 to 3 percent slopes. These nearly level soils are on flood plains. They formed in recent alluvium. The Fluvaquents are in low areas that are flooded frequently; the Udifluvents are in slightly higher areas. The soils are deep, are very poorly drained to moderately well drained,

and are loamy. Most areas of this complex are along high-gradient streams. The areas are mostly long and narrow and are generally 3 to 30 acres in size.

The complex is about 45 percent Fluvaquents, 35 percent Udifluvents, and 20 percent other soils. The individual soils are so intermingled that they could not be mapped separately.

Many areas of these soils are scoured by old drainage channels. During periods of heavy flooding, the soil deposits in some areas are shifted from one place to another. Large areas consist of stratified gravelly deposits having a thin surface layer of silty alluvium. Some small areas of this unit along the Hudson River consist of silt dredged or pumped from the river; the dredgings contain 2 to 4 feet of dark bluish gray silt with few coarse fragments.

Fluvaquents are too variable to have a typical profile. The surface layer is gray and ranges from gravelly sandy loam to silt loam. The substratum is gray or brown and is mottled; it ranges from silty clay loam to very gravelly coarse sand.

Udifluvents are also too variable to have a typical profile. The surface layer is brown and ranges from silt loam to gravelly fine sandy loam. The substratum is brownish or yellowish and ranges from silt loam to very gravelly sand.

Included with these soils in mapping are small areas of muck soils and wet soils and areas of soils that have stratified gravel layers close to the surface. Small areas of soils that are less than 40 inches deep to bedrock are also included. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

These soils are flooded frequently, and in many areas are wet for prolonged periods. Bedrock is usually at a depth of more than six feet. Permeability, available water capacity, organic matter content, and reaction vary considerably, depending on the source of the alluvium.

Most of the acreage of this complex is idle or is used for pasture.

Frequent flooding and prolonged wetness in many areas make this map unit unsuitable for crops. The irregular surface, which results from stream gouging and deposition of gravel and cobblestones on the surface, also limits the use of equipment for planting and harvesting.

Many areas of these soils can be used for pasture. Annual mowing, reseeding, and applying fertilizer are difficult because of uneven land surface and poor accessibility to some areas.

In general, these soils are not suitable for woodland production. Shrubs and forbs and low grade hardwoods such as cottonwood, red maple, and poplar grow in many places and provide food and habitat for wildlife.

These soils are not suitable for urban uses because of the frequent flooding and prolonged wetness.

The capability classification is Vw.

FrA—Fredon silt loam, 0 to 4 percent slopes. This nearly level soil is in depressional areas. It is deep and is somewhat poorly drained and poorly drained. In most areas slope is less than 3 percent. The areas are rectangular and are generally 3 to 20 acres in size.

Typically, the surface layer is friable, dark grayish brown silt loam 8 inches thick. The subsoil is friable and extends to a depth of 23 inches. The upper part of the subsoil is pale olive gravelly silt loam, and the lower part is light olive gray very fine sandy loam. The substratum is loose and extends to a depth of 60 inches. The upper part is very dark grayish brown very gravelly coarse sand, and the lower part is very dark grayish brown sand.

Included with this soil in mapping are small areas of Castile soils, which are moderately well drained. Also included are a few areas of very poorly drained soils that have a mucky surface layer, soils that have a gravelly surface layer, sandy soils, and soils that have free lime below a depth of 4 feet. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

The water table is no more than 18 inches below the surface in spring and during prolonged wet periods. The high water table restricts rooting depth. In summer, the water table recedes and roots extend to greater depths. Permeability is moderate in the subsoil and rapid in the substratum. Available water capacity is moderate to high. Runoff is slow or very slow. Reaction is strongly acid to neutral in the surface layer and subsoil and medium acid to moderately alkaline in the substratum. Depth to bedrock is more than 5 feet.

Some areas of this soil are used for hay or pasture. Other areas are idle or are in woodland.

This soil is suitable for farming. Artificial drainage improves suitability for cultivated crops. Adequate outlets may be difficult to locate because this soil is in the broad, flat areas. Small stones interfere with some tillage operations and can cause excessive wear of machinery. If the soil is drained, the response of crops to lime and fertilizer is good.

The seasonal high water table limits the use of this soil for pasture. Animals should be kept off this soil during spring and other wet periods to lessen soil compaction and loss of pasture seedings. Restricted grazing during drier periods, rotational grazing, and annual mowing are also needed.

Potential productivity for timber is moderate. The seasonal high water table severely hinders use of equipment, and the shallow rooting depth creates a windthrow hazard. Eastern white pine, white spruce, Norway spruce, and yellow-poplar are suitable for planting.

This soil has limitations for urban uses. The prolonged high water table can cause wet basements and severely limits functioning of septic tank absorption fields.

The capability classification is IIIw.

GlC—Glover very stony loam, very rocky, sloping. This soil is on hilltops and ridges on the grit plateau. Slope ranges from 3 to 15 percent but is mostly 8 to 15 percent. This soil is shallow and somewhat excessively drained. Large stones and boulders are on the surface about 5 to 30 feet apart. Outcrops and exposed ledges of bedrock make up 1 to 10 percent of the area. The areas are long and irregular in shape and are 40 to 100 acres in size.

Typically, the surface layer is very friable, black loam 2 inches thick. The subsoil is friable, brown loam to a depth of 18 inches. Hard graywacke sandstone is at a depth of 18 inches.

Included with this soil in mapping are areas of Buckland, Brayton, Loxley, and Beseman soils. Buckland soils are well drained and moderately well drained and are deep. Brayton soils, in wetter areas, are somewhat poorly drained and poorly drained. Loxley and Beseman soils are in depressions. Also included are areas of soils that are 20 to 60 inches deep. Areas of included soils make up 25 percent of this map unit and are as large as 10 acres.

Bedrock is at a depth of 10 to 20 inches. Rooting depth is limited by the bedrock. Permeability is moderate. Available water capacity is very low to moderate. Runoff is medium. In unlimed areas, reaction is medium acid to very strongly acid throughout.

Most areas of this soil are used for woodland. A few areas are marginal pasture.

Shallow depth, rock outcrops, and numerous boulders on the surface make this soil generally unsuitable for row crops and hay. Also, the growing season is short.

Some areas of this soil can be used for pasture. However, bedrock outcrops and numerous boulders make pasture management very difficult. Overgrazing weakens the plant cover and increases the hazard of erosion. Proper seeding rates and rotational grazing are needed.

Potential productivity for woodland is moderate. Trees grow slowly because of the restricted rooting depth. Seedling mortality is severe because the soil is droughty. The boulders and rock outcrops generally prevent the use of machinery for planting. Eastern white pine and white spruce can be planted by hand.

This soil is not suitable for urban development because of shallowness and the outcrops of bedrock.

The capability classification is VIs.

GlD—Glover very stony loam, very rocky, moderately steep. This soil is on hillsides, mountainsides, and sides of ridges on the grit plateau. Slope ranges from 15 to 35 percent but is mostly 15 to 25 percent. This soil is shallow and somewhat excessively drained. Large stones and boulders are on the surface about 5 to 30 feet apart. Outcrops of bedrock make up 1 to 10 percent of the area. The areas are long and irregular in shape and are 40 to 100 acres in size.

Typically, the surface layer is very friable, black loam 2 inches thick. The subsoil is friable, brown loam to a depth of 18 inches. At a depth of 18 inches is hard graywacke sandstone.

Included with this soil in mapping are areas of Buckland, Brayton, Loxley, and Beseman soils. Buckland soils are well drained and moderately well drained and are more than 5 feet deep. Brayton soils, in wetter areas, are somewhat poorly drained and poorly drained. Loxley and Beseman soils are in depressions. Also included are areas of soils that are 20 to 60 inches deep. Areas of included soils make up 25 percent of this map unit and are as large as 10 acres.

Bedrock is at a depth of 10 to 20 inches. Rooting depth is limited by the bedrock. Permeability is moderate. Available water capacity is very low to moderate. Runoff is rapid or very rapid. In unlimed areas, reaction is medium acid to very strongly acid throughout.

Most areas of this soil are used for woodland. A few areas are marginal pasture.

This soil is generally not suitable for cultivated crops and hay. Steepness, bedrock outcrops, shallow depth, numerous boulders, and a short growing season are the principal limitations.

Some areas of this soil can be used for pasture. Overgrazing weakens the plant cover and increases the hazard of erosion. Proper seeding rates and rotational grazing are needed.

Potential productivity for woodland is moderate. Seedling mortality is high because the soil is droughty. The steep slope and rock outcrops hinder use of machinery for harvesting and planting. Constructing logging roads on the contour and using water bars reduce erosion. Eastern white pine and white spruce are suitable for planting.

This soil is not suitable for urban development because of the moderately steep slope, shallowness, and outcrops of bedrock.

The capability classification is VIIs.

GmF—Glover-Rock outcrop complex, very steep. This complex consists of Glover soils and outcrops of bedrock on hillsides and mountainsides on the grit plateau. Slope ranges from 35 to 50 percent. The Glover soil is shallow and somewhat excessively drained. Numerous boulders are on the surface about 5 to 30 feet apart.

This complex is 55 percent Glover soil, 20 percent Rock outcrop, and 25 percent other soils. The areas of soil and of Rock outcrop are so intermingled that they could not be mapped separately. The areas of this complex are long and narrow and are 10 to 60 acres in size.

Typically, the surface layer of the Glover soil is very friable, black loam 2 inches thick. The subsoil is friable,

brown loam to a depth of 18 inches. Hard graywacke sandstone is at a depth of 18 inches.

The Rock outcrop is ledges, large blocks, and protrusions of exposed rock.

Included in mapping are areas of Buckland soils, which are well drained and moderately well drained and are more than 5 feet deep. Also included are areas of soils that are 20 to 60 inches deep. Areas of included soils make up 25 percent of this map unit and are as large as 10 acres.

In the Glover soil, bedrock is at a depth of 10 to 20 inches. Rooting depth is limited by the bedrock. Permeability is moderate. Available water capacity is very low to moderate. Runoff is very rapid. In unlimed areas, reaction is medium acid to very strongly acid throughout.

All areas of this complex are used for woodland.

Slope and the Rock outcrops limit any farm use.

Potential productivity for woodland is moderate. The very steep slope creates a severe erosion hazard. The slope and the Rock outcrops severely hinder use of machinery in harvesting and planting. Constructing logging roads on the contour and using water bars reduce erosion. Seedling mortality is severe because the soil is droughty. Eastern white pine and white spruce are suitable for planting.

This soil is not suitable for urban development because of very steep slope, shallowness, and outcrops of bedrock.

The capability classification is VIIs.

HaA—Hamlin silt loam, 0 to 3 percent slopes. This nearly level soil is in flat to slightly convex areas on flood plains. It is deep and well drained. The areas are long and narrow along smaller streams and wide along the Hudson River. The areas are 3 to 100 acres in size.

Typically, the surface layer is friable, dark grayish brown silt loam 9 inches thick. The subsoil is friable, brown silt loam 25 inches thick. The substratum is friable, dark yellowish brown silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Teel and Limerick soils. Teel soils are moderately well drained to somewhat poorly drained, and Limerick soils are poorly drained. Also included are small areas of wet soils that are very poorly drained. Included in many stream valleys in the uplands and in the Hoosick River valley are areas of soils that have a gravelly substratum. Also included are spots of soils that have surface deposits of sandy or gravelly material. Some areas in narrow stream valleys are frequently flooded during intense storms. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

In most areas, these soils are flooded occasionally. Along the Hudson River where control structures exist, flooding is rare. Permeability is moderate. Available water capacity is high. Runoff is slow. Reaction is strongly acid to neutral in the surface layer and subsoil. Depth to bedrock is more than 60 inches.

This soil is used for row crops, hay, and pasture. Some areas have been developed for urban uses.

This soil is well suited to a wide variety of crops and to most cultural practices. The major limitation is the occasional flooding, although flooding usually occurs early in spring. The more frequently flooded areas are less suitable for row crops. Some places are limited by stream gouging and detrimental deposition.

This soil is well suited to pasture. Cattle should be kept off this soil in spring and during wet periods to prevent soil compaction and loss of pasture seedings. Proper seeding rates to maintain key plant species, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is high. There are few limitations on use of equipment, and seedling mortality is low. Competition from other plants interferes with establishment of stands of conifers. Eastern white pine, black locust, Norway spruce, black walnut, and European larch are suitable for planting.

This soil is poorly suited to urban uses because of the flooding. This soil is a good source of topsoil.

The capability classification is I.

HbA—Haven silt loam, 0 to 3 percent slopes. This nearly level soil formed in glacial outwash in which loamy deposits up to 3 feet thick cover sandy and gravelly material. This soil is deep and well drained. The areas are irregular in shape and are generally 3 to 20 acres in size.

Typically, the surface layer is friable, dark grayish brown silt loam 10 inches thick. The friable subsoil extends to a depth of 30 inches. The upper part of the subsoil is yellowish brown silt loam, the middle part is yellowish brown very fine sandy loam, and the lower part is yellowish brown silt loam. The substratum is loose, dark brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Riverhead soils, which have more sand in the subsoil than this Haven soil. Also included are small areas of Hoosic and Chenango soils. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is moderate in the subsoil and very rapid in the substratum. Available water capacity is moderate to high. Runoff is slow. In unlimed areas, reaction is very strongly acid to medium acid in the subsoil. Depth to bedrock is more than 5 feet.

This soil is used mainly for row crops, hay, and pasture.

This soil is well suited to most crops grown in the area. Crop rotation, cover crops, conservation tillage, and crop residue returned to the soil maintain tilth and improve available water capacity of the soil.

This soil is well suited to pasture. Rotational grazing, annual mowing, and control of overgrazing are important.

Potential productivity for timber is moderately high. Seedlings can be planted by machine. Eastern white pine, red pine, Norway spruce, and European larch are suitable for planting.

This soil has few limitations for urban uses. The effluent from septic tank systems can pollute ground water because the substratum of this soil is very rapidly permeable. This soil is a probable source of sand and gravel.

The capability classification is I.

HbB—Haven silt loam, 3 to 8 percent slopes. This gently sloping soil formed in glacial outwash deposits in which loamy deposits up to 3 feet thick cover sandy and gravelly material. This soil is deep and well drained. The areas are oval and are generally 3 to 15 acres in size.

Typically, the surface layer is friable, dark grayish brown silt loam 10 inches thick. The subsoil is friable and extends to a depth of 30 inches. The upper part of the subsoil is yellowish brown silt loam, the middle part is yellowish brown very fine sandy loam, and the lower part is yellowish brown silt loam. The substratum is loose, dark brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Riverhead soils, which have more sand in the subsoil than this Haven soil. Also included are small areas of Hoosic and Chenango soils. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

Permeability is moderate in the subsoil and very rapid in the substratum. Available water capacity is moderate to high. Runoff is medium. In unlimed areas, reaction is very strongly acid to medium acid in the subsoil. Depth to bedrock is more than 5 feet.

This soil is used mainly for row crops, hay, and pasture.

This unit is well suited to most crops grown in the area. Because this soil is gently sloping, erosion can be a hazard, particularly where slopes are long. Contour tillage, cover crops, crop rotation, conservation tillage, and crop residue returned to the soil reduce erosion, improve available water capacity, and maintain tilth. This soil is more difficult to irrigate than the nearly level Haven soil and tends to be more droughty.

This soil is suited to pasture. Overgrazing can lead to soil erosion and reduce the quality of the pasture seeding. Rotational grazing, annual mowing, and stocking the proper number of animals per acre help to maintain production.

Potential productivity for woodland is moderately high. There are few limitations for woodland management. Eastern white pine, red pine, Norway spruce, and European larch are suitable for planting.

This soil is suited to most urban uses. Erosion is a hazard during construction. Effluent from septic systems can pollute ground water because water moves rapidly through the substratum. This soil is a probable source of sand and gravel.

The capability classification is IIe.

HoA—Hoosic gravelly sandy loam, 0 to 3 percent slopes. This nearly level soil formed in glacial outwash that has a high content of sand and gravel. This soil is deep and is well drained to excessively drained. The areas are broad and oval or irregular in shape and are 3 to 50 acres in size.

Typically, the surface layer is very friable, very dark grayish brown gravelly sandy loam 9 inches thick. The subsoil extends to a depth of 23 inches. The upper part of the subsoil is friable, dark yellowish brown gravelly sandy loam; and the lower part is very friable, dark yellowish brown very gravelly sandy loam. The substratum is loose, brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of a soil that has more sand in the surface layer and subsoil than this Hoosic soil. Also included are small areas of Chenango, Castile, and Fredon soils. Chenango soils are loamy to a greater depth than this Hoosic soil. Castile soils are moderately well drained, and Fredon soils are somewhat poorly drained to poorly drained; these soils are in low areas. A few small spots of soils that have stratified layers close to the surface are also included. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid or rapid in the subsoil and very rapid in the substratum. Available water capacity is very low to moderate. Runoff is slow. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and the subsoil. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for corn, hay, or pasture. A few areas are in urban use, including housing.

This soil is suited to most crops grown in the area. Droughtiness and small rock fragments are the main limitations for farming. Irrigation can increase yields in most areas. Gravel and cobblestones can cause excessive wear of farm machinery. Conservation tillage, crop rotation, cover crops, and crop residue returned to the soil improve tilth and increase available water capacity of the soil.

This soil is suitable for pasture, but droughtiness limits growth in most years. Rotational grazing, stocking the proper number of animals per acre, and annual mowing help to maintain pasture production.

Potential productivity for timber is moderately high. Droughtiness slows tree growth, and can increase seedling mortality if planting is delayed too long in spring. Eastern white pine, red pine, and European larch are suitable for planting.

This soil is suited to most urban uses. Small stones and gravel interfere with many uses, including landscaping and establishing lawns. Effluent from septic systems can pollute ground water because water moves rapidly through this soil. This soil is a probable source of sand and gravel.

The capability classification is IIs.

HoB—Hoosic gravelly sandy loam, 3 to 8 percent slopes. This gently sloping soil formed in glacial outwash that has a high content of sand and gravel. This soil is deep and is well drained to excessively drained. The areas are roughly oval and are 3 to 50 acres in size.

Typically, the surface layer is very friable, very dark grayish brown gravelly sandy loam 9 inches thick. The subsoil extends to a depth of 23 inches. The upper part of the subsoil is friable, dark yellowish brown gravelly sandy loam; and the lower part is very friable, dark yellowish brown very gravelly sandy loam. The substratum is loose, brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of a soil that has more sand in the surface layer and subsoil than this Hoosic soil. Also included are small areas of Chenango, Castile, and Fredon soils. Chenango soils are loamy to a greater depth than this Hoosic soil. Castile soils are moderately well drained, and Fredon soils are somewhat poorly drained to poorly drained; these soils are in low areas. A few small spots of soils that have stratified layers close to the surface are also included. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid or rapid in the subsoil and very rapid in the substratum. Available water capacity is very low to moderate. Runoff is medium. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and the subsoil. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for corn, hay, or pasture. A few areas are in urban use, including housing.

This soil is suited to most crops grown in the area. Droughtiness and the many small rock fragments are the main limitations for farming. Irrigation can increase yields, but the gentle slopes create problems in applying water and increase the hazard of erosion. This soil is more difficult to irrigate than the nearly level Hoosic soil. Gravel and cobblestones cause excessive wear of farm machinery. Contour plowing, conservation tillage, crop rotation, cover crops, and crop residue returned to the soil improve tilth and increase available water capacity of the soil.

This soil is suitable for pasture. Droughtiness is the main limitation; it slows growth in midsummer. Rotational grazing, stocking the proper number of animals per acre, and applying lime and fertilizer help to maintain desirable pasture plants.

Potential productivity for woodland is moderately high. Droughtiness slows growth of trees and increases seedling mortality if planting is delayed early in spring. Eastern white pine, red pine, and European larch are suitable for planting.

This soil is suited to most urban uses. Small stones interfere with many uses. Effluent from septic tank systems can pollute ground water because water moves rapidly through this soil. This soil is a probable source of sand and gravel.

The capability classification is IIs.

HoC—Hoosic gravelly sandy loam, rolling. This soil formed in glacial till that has a high content of sand and gravel. Slope ranges from 5 to 16 percent but is mostly 8 to 15 percent. This soil is deep and is well drained to excessively drained. The areas are irregular in shape and are 3 to 50 acres in size.

Typically, the surface layer is very friable, very dark grayish brown gravelly sandy loam about 9 inches thick. The subsoil extends to a depth of 23 inches. The upper part of the subsoil is friable, dark yellowish brown gravelly sandy loam; and the lower part is very friable, dark yellowish brown very gravelly sandy loam. The substratum is loose, brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of soils that have a nongravelly, silty surface layer. Also included are a few areas of Windsor and Riverhead soils. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid or rapid in the subsoil and very rapid in the substratum. Available water capacity is very low to moderate. Runoff is medium to rapid. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and the subsoil. Depth to bedrock is more than 60 inches.

This soil is used mostly for corn, hay, or pasture.

This soil is suited to many crops grown in the area. Droughtiness, slope, erodibility, and small rock fragments are the main limitations. The complex slopes are erodible and difficult to work with modern farm machinery. Cover crops, longterm hay crops in the rotation, conservation tillage, and crop residue returned to the soil reduce erosion, improve tilth, maintain organic matter content, and reduce droughtiness. Gravel and cobblestones interfere with some tillage operations and cause excessive wear of machinery. Lime and fertilizer are rapidly leached from this soil.

This soil is suited to pasture. On longer slopes, overgrazing can increase erosion and weaken the sod. Droughtiness limits plant growth in most summers. Proper seeding rates to maintain desirable plant species, rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for woodland is moderately high. Erosion of skid trails can be reduced by constructing

them on the contour and using water bars. Droughtiness slows tree growth and increases seedling mortality if planting is delayed in spring. Removing brush, planting carefully, and planting early in spring improve seedling survival. Eastern white pine, red pine, and European larch are suitable for planting.

This soil has limitations for some urban uses. Steepness and complexity of slopes are the main limitations. Small stones, droughtiness, and rapid percolation also limit some uses. This soil is a probable source of sand and gravel.

The capability classification is IIIe.

HoD—Hoosic gravelly sandy loam, hilly. This soil formed in glacial outwash that has a high content of sand and gravel. Slopes are short and complex; slope ranges from 10 to 30 percent but is mostly 15 to 25 percent. This soil is deep and is well drained to excessively drained. The areas are irregular in shape and are 3 to 50 acres in size.

Typically, the surface layer is very friable, very dark grayish brown gravelly sandy loam about 9 inches thick. The subsoil extends to a depth of 23 inches. The upper part of the subsoil is friable, dark yellowish brown gravelly sandy loam; and the lower part is very friable, dark yellowish brown very gravelly sandy loam. The substratum is loose, brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are spots where the soil has been severely eroded, so that stratified sand and gravel are at or near the surface. Also included are small areas of soils that have more sand in the surface layer and subsoil than this Hoosic soil and areas of Windsor and Riverhead soils. Included in depressions are a few areas of Fredon soils, which are somewhat poorly drained and poorly drained. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid or rapid in the subsoil and very rapid in the substratum. Available water capacity is very low to moderate. Runoff is rapid. In unlimed areas, reaction is very strongly acid or strongly acid in the surface layer and in the subsoil. Depth to bedrock is more than 60 inches.

A large part of this mapping unit is used for pasture or woodland. Some areas are used for hay.

This soil is poorly suited to cultivated crops. The short, steep slopes make operation of farm machinery dangerous, and these slopes are highly erodible. Applying conservation practices is difficult because of the steepness and complexity of the slopes.

This soil is suitable for pasture, but overgrazing increases the hazard of severe erosion and the loss of pasture plants. Droughtiness generally reduces pasture yields. Proper seeding rates, rotational grazing, annual mowing, and broadcast applications of lime and fertilizer are needed.

Potential productivity for timber is moderately high. Erosion is a hazard in steep areas, but it can be reduced by constructing logging roads on the contour and using water bars. The hilly topography hinders use of machinery for planting. Droughtiness slows growth of trees. Planting early in spring improves seedling survival. Eastern white pine, red pine, and European larch are suitable for planting.

This soil has severe limitations for most urban uses. Moderately steep slope and the complexity of the slopes are the main limitations. Rapid runoff, rapid percolation, many small stones, and droughtiness also limit urban uses. This soil is a probable source of sand and gravel.

The capability classification is IVe.

HoE—Hoosic gravelly sandy loam, steep. This soil formed in glacial outwash that has a high content of sand and gravel. Slope ranges from 25 to 50 percent but is mostly 25 to 40 percent. This soil is deep and is well drained to excessively drained. Most areas are long, narrow strips 3 to 50 acres in size.

Typically, the surface layer is very friable, very dark grayish brown gravelly sandy loam 9 inches thick. The subsoil extends to a depth of 23 inches. The upper part of the subsoil is friable, dark yellowish brown gravelly sandy loam; and the lower part is very friable, dark yellowish brown very gravelly sandy loam. The substratum is loose, brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are spots where the soil has been severely eroded, so that stratified sand and gravel are at the surface. Some areas of this soil are steeper, and some are less sloping. Also included are small spots of soils that have a sandier subsoil than this Hoosic soil and small areas of Windsor and Riverhead soils. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid or rapid in the solum and very rapid in the substratum. Available water capacity is very low to moderate. Runoff is very rapid. Reaction is very strongly acid or strongly acid in the surface layer and the subsoil. Depth to bedrock is more than 60 inches.

Some areas of this soil are used for unimproved pasture, but most of the acreage is wooded or is idle.

This soil is not suitable for cultivated crops or hay. The steep slopes are erodible, and operation of farm machinery is dangerous. Other limitations are droughtiness and the large gravel content.

This soil is generally not suitable for pasture. It is droughty and difficult to manage. Grazing is generally limited to early spring and late fall. Overgrazing will damage the sod cover and increase the hazard of severe erosion.

Potential productivity for timber is moderately high, but steep slope hinders use of equipment and increases the hazard of erosion. Machine planting is usually not

feasible, and hand planting is difficult. Constructing logging roads on the contour and using water bars reduce erosion. Droughtiness slows growth of trees and increases seedling mortality.

This soil is generally not suitable for urban uses. Steep slope is the main limitation. The many small stones, rapid runoff, and rapid percolation also limit urban uses. This soil is a probable source of sand and gravel.

The capability classification is VIe.

HuB—Hudson silt loam, 3 to 8 percent slopes. This gently sloping soil formed in silt and clay deposits. This soil is deep and moderately well drained. The areas are long and wide and are 10 to 30 acres.

Typically, the surface layer is friable, dark brown silt loam 5 inches thick. The subsurface layer is friable, brown silt loam 3 inches thick. The subsoil is firm and extends to a depth of 28 inches. The upper part of the subsoil is yellowish brown silty clay, and the lower part is plastic and sticky, mottled, brown silty clay. The substratum is light olive brown and grayish brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are areas of Rhinebeck and Nassau soils. Rhinebeck soils are somewhat poorly drained. Nassau soils are shallow. Also included are areas of soils that have a mantle of gravelly silt loam or gravelly silty clay loam 12 to 18 inches thick. In some places are areas of soils that have a sandy surface layer. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

Early in spring, a seasonal high water table is perched 18 to 24 inches below the surface. Rooting depth is somewhat restricted by the firm, clayey subsoil. Permeability is moderate to moderately slow in the surface layer and slow or very slow in the subsoil. Available water capacity is high. Runoff is medium. In unlimed areas, reaction is strongly acid to neutral in the surface and subsurface layers and medium acid to mildly alkaline in the subsoil. Depth to bedrock is more than 60 inches.

This soil is used for row crops, hay, and pasture. Urban use is common in the western part of the county.

This soil is suited to most crops grown in the area. Erosion is a hazard, particularly on long slopes. Wetness can delay planting in spring and harvesting in fall. If this clayey soil is plowed when wet, the soil will clod and become crusted, less porous, and difficult to work. Frost heaving can damage alfalfa. Cross-slope tillage, cover crops, crop rotation, conservation tillage, and crop residue incorporated into the soil reduce erosion, increase organic matter content, and promote good tilth. Drainage of wet spots allows more efficient use of fields.

This soil is suited to pasture. Restricting grazing during wetter periods and rotational grazing prevent soil compaction, maintain pasture seedings, and reduce erosion.

Potential productivity for timber is high. Seedlings can be planted by machine, but seasonal wetness may delay planting early in spring. Eastern white pine, yellow-poplar, and black walnut are suitable for planting.

This soil is limited for urban uses by the seasonal wetness and the slow or very slow permeability in the subsoil and substratum. Erosion is a severe hazard during construction. Frost heaving is a problem for many uses.

The capability classification is IIe.

HuC—Hudson silt loam, 8 to 15 percent slopes. This sloping soil formed in silt and clay deposits. It is deep and moderately well drained. Numerous drainageways dissect the landscape. The areas are long and wide and are 10 to 40 acres in size.

Typically, the surface layer is friable, dark brown silt loam 5 inches thick. The subsurface layer is friable, brown silt loam 3 inches thick. The subsoil is firm and extends to a depth of 28 inches. The upper part of the subsoil is yellowish brown silty clay, and the lower part is plastic and sticky, mottled, brown silty clay. The substratum is firm, plastic and sticky, grayish brown and light olive brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Rhinebeck, Scio, and Nassau soils. Rhinebeck soils are somewhat poorly drained and are in low areas and near the bottom of drainageways. Nassau soils are shallow. Also included are spots where the clayey subsoil is exposed. Also included are a few areas of soils that have a mantle of gravelly silt loam or gravelly silty clay loam 12 to 18 inches thick and areas of soils that have a loamy fine sand surface layer. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Early in spring, a seasonal high water table is perched 18 to 24 inches below the surface. Rooting depth is somewhat restricted by the firm, clayey subsoil. Permeability is moderate to moderately slow in the surface and subsurface layers and slow or very slow in the subsoil. Available water capacity is high. Runoff is rapid. In unlimed areas, reaction is strongly acid to neutral in the surface and subsurface layers and medium acid to mildly alkaline in the subsoil. Depth to bedrock is more than 60 inches.

This soil is used for row crops, hay, and pasture. Urban use is common in the western part of the county.

This soil is suited to most crops grown in the area. However, row crops should be grown in rotation with hay crops. Erosion is a serious hazard, particularly on long slopes. Wetness can delay planting in spring and harvesting in fall. If this clayey soil is plowed or cultivated in wet periods, the soil will clod and the surface will crust. The soil is difficult to manage when wet. Frost heaving can damage alfalfa. Cross-slope tillage, stripcropping, cover crops, crop rotation,

conservation tillage, and crop residue incorporated into the soil reduce erosion, increase organic matter content, and promote good tilth. Draining wet spots and drainageways allows more efficient use of some fields.

This soil is suited to pasture. Restricting grazing during wetter periods and rotational grazing prevent soil compaction, maintain pasture seedings, and reduce erosion. The hazard of erosion is more severe on long slopes.

Potential productivity for timber is high. Seedlings can be planted by machine, but seasonal wetness may delay planting early in spring. Constructing logging roads across the slope reduces erosion. Eastern white pine, yellow-poplar, and black walnut are suitable for planting.

This soil is limited for urban uses by the seasonal wetness and the slow or very slow permeability of the subsoil and substratum. Erosion is a severe hazard during construction. Frost heaving is also a problem for some uses.

The capability classification is IIIe.

HuD—Hudson silt loam, hilly. This moderately steep soil formed in silt and clay deposits. Slope ranges from 10 to 30 percent but is mostly 15 to 25 percent. This soil is deep and moderately well drained. The areas are long and wide and are generally 3 to 30 acres in size.

Typically, the surface layer is friable, dark brown silt loam 5 inches thick. The subsurface layer is friable, brown silt loam 3 inches thick. The subsoil is firm and extends to a depth of 28 inches. It is yellowish brown silty clay in the upper part and is plastic and sticky, mottled, brown silty clay in the lower part. The substratum is firm, plastic and sticky, grayish brown and light olive brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Nassau soils, which are shallow. Also included are areas of soils that have a loamy fine sand surface layer or a gravelly surface layer. In some spots this soil is so eroded that the subsoil is exposed. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Early in spring, a seasonal high water table is perched 18 to 24 inches below the surface. Rooting depth is somewhat restricted by the clayey subsoil. Permeability is moderate to moderately slow in the surface and subsurface layers and slow or very slow in the subsoil. Available water capacity is high. Runoff is rapid to very rapid. In unlimed areas, reaction is strongly acid to neutral in the surface and subsurface layers and medium acid to mildly alkaline in the subsoil. Depth to bedrock is more than 60 inches.

This soil is used mostly for pasture, hay, and woodland. Some areas are idle.

This soil is poorly suited to cultivated crops because of the moderately steep slope. Erosion is a hazard. Hay generally does well on this soil, but deep-rooted plants can be damaged by frost heaving.

This soil is suited to pasture. Restricting grazing during wetter periods maintains pasture seedings and reduces erosion. Rotational grazing is also needed. The hazard of erosion is more severe on the longer slopes.

Potential productivity for timber is high. However, the short, dissected, moderately steep slopes cause serious problems in management. Erosion of logging roads is a severe hazard. Constructing logging roads on the contour and using water bars reduce erosion. Eastern white pine, yellow-poplar, and black walnut are suitable for planting.

This soil has limitations for urban uses. The principal limitations are moderately steep slope, severe erosion hazard, the seasonal high water table, frost action, and slow or very slow permeability. This soil is also subject to sliding and slumping when undercut during road construction and maintenance.

The capability classification is IVe.

HuE—Hudson silt loam, steep. This soil formed in silt and clay deposits. Slope ranges from 25 to 45 percent but is mostly 25 to 35 percent. This soil is deep and moderately well drained. The areas are long and narrow and are generally 3 to 40 acres in size.

Typically, the surface layer is friable, dark brown silt loam 5 inches thick. The subsurface layer is friable, brown silt loam 3 inches thick. The subsoil is firm and extends to a depth of 28 inches. It is yellowish brown silty clay in the upper part and plastic and sticky, mottled, brown silty clay in the lower part. The substratum is firm, plastic and sticky, grayish brown and light olive brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Unadilla and Windsor soils. Unadilla soils are well drained, and Windsor soils are excessively drained. Also included are areas of soils that have a gravelly surface layer and areas of loamy alluvial soils along small drainageways. In spots this soil is so eroded that the clayey subsoil is exposed. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Early in spring, a seasonal high water table is perched 18 to 24 inches below the surface. Rooting depth is somewhat restricted by the clayey subsoil. Permeability is moderate to moderately slow in the surface and subsurface layers and slow or very slow in the subsoil. Available water capacity is high. Runoff is very rapid. In unlimed areas, reaction is strongly acid to neutral in the surface and subsurface layers and medium acid to mildly alkaline in the subsoil. Depth to bedrock is more than 60 inches.

This soil is used mostly for woodland or is idle. A small acreage is used for pasture.

This soil is not suited to crops because it is too steep for safe operation of tillage equipment and because erosion is a severe hazard.

Because of the steepness, this soil is generally not suitable for pasture. Restricted grazing, rotational grazing, and maintaining a good sod cover reduce erosion. Pasture management is difficult because operation of machinery is dangerous on the steep slopes.

Potential productivity for timber is high. The erosion hazard and steepness cause severe problems in timber management. Constructing logging roads on the contour and using water bars and other water control devices reduce erosion. Low soil strength causes soil slippage and makes construction and maintenance of roads difficult.

This soil is not suitable for urban uses. It is steep and clayey. The main limitations are slow or very slow permeability, steep slope, a severe hazard of erosion, and a hazard of sliding and slumping.

The capability classification is VIe.

LmA—Limerick silt loam, 0 to 3 percent slopes. This nearly level soil is in low areas on flood plains. It formed in alluvium of silt and fine sand. This soil is deep and poorly drained and is seasonally flooded. Most areas are oblong and are 10 to 25 acres in size.

Typically, the surface layer is friable, very dark grayish brown silt loam 8 inches thick. The substratum is friable, grayish brown very fine sandy loam and silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of soils that have gravel and coarse sand in the surface layer. Along smaller streams are areas of soils that have thin stratified lenses of sand and gravel in the upper 40 inches. Included in higher areas on the flood plain are spots of Hamlin and Teel soils. Hamlin soils are well drained, and Teel soils are somewhat poorly drained and moderately well drained. A few spots of very poorly drained organic soils are also included. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

This soil is subject to frequent flooding, especially early in spring. A seasonal high water table is near the surface in winter and spring and during prolonged wet periods. In addition, tides along the Hudson River cause daily fluctuations that bring the water table near the surface in that area. Rooting depth is restricted by the high water table. Permeability is moderate throughout the soil. Available water capacity is high. Runoff is slow. Reaction is strongly acid to neutral in the surface layer and medium acid to neutral in the substratum. Depth to bedrock is more than 5 feet.

A large acreage of this soil is unimproved pasture or is idle.

This soil is suitable for hay and some cultivated crops. The main limitations are the high water table and periodic flooding. This soil needs drainage for hay and crops. Drainage removes excess surface water more quickly. Drainage outlets, however, are hard to locate because of the low position of this soil.

This soil is suitable for pasture. The main limitations are frequent flooding and the high water table. If adequate outlets are available, open ditches can improve drainage. Restricting grazing when the water table is at or near the surface and rotational grazing reduce soil compaction and trampling of the pasture.

Potential productivity for timber is moderate. Prolonged wetness limits use of equipment and causes severe seedling mortality. Rooting depth for trees is shallow, so there is a hazard of trees being blown over by strong winds. White spruce and northern white-cedar are suitable for planting.

This soil is not suitable for urban development, principally because of the high water table and frequent flooding.

The capability classification is IVw.

LoA—Loxley and Beseman mucks, 0 to 1 percent slopes. These nearly level organic soils are in broad, wet depressions in the larger stream valleys and on till plains on the grit plateau. The organic material is well decomposed remains of woody and herbaceous plants 16 to 60 inches thick over mineral deposits. The soils are very poorly drained.

This unit is about 60 percent Loxley soils, 25 percent Beseman soils, and 15 percent other soils. The Loxley and Beseman soils were mapped together because their use and management are the same. Some areas are mostly Loxley soils, some are mostly Beseman soils, and many contain both kinds of soil. The areas of this map unit are wide and oval to elongated in shape, and they are 10 to 100 acres in size.

Typically, the surface layer of the Loxley soils is very dark brown muck 5 inches thick. Below this is black, dark reddish brown, and very dark grayish brown muck to a depth of 60 inches or more.

Typically, the surface layer of the Beseman soils is dark reddish brown muck 8 inches thick. Below this is dark reddish brown and black muck to a depth of 38 inches. The mineral substratum is gray loamy glacial till to a depth of 60 inches or more.

Included with these soils in mapping are small areas of mineral soils, including moderately well drained to poorly drained gravelly soils, somewhat poorly drained to poorly drained Brayton soils, and alluvial soils along streams. Areas of included soils make up 15 percent of this map unit and are as large as 10 acres.

These soils are frequently ponded or flooded. In summer the water table is a few feet below the surface in some areas. The prolonged high water table limits rooting depth. Permeability is moderate to moderately rapid in the organic layers. It is moderately slow in the mineral substratum of the Beseman soils. Available

water capacity is high, and runoff is very slow. Reaction is dominantly very strongly acid in the organic layers. It ranges to neutral in the mineral substratum of the Beseman soils.

Most areas of this map unit are wooded or are covered with water-tolerant herbaceous plants, forbs, and woody shrubs.

These soils are not suitable for farming. Drainage outlets are extremely difficult to establish, and the growing season is very short because of the high elevation and cold climate.

Potential productivity for timber is low on the Loxley soils and moderate on the Beseman soils. Species that tolerate wetness grow in some areas, but only very slowly. The prolonged high water table causes severe equipment limitations, windthrow hazard, and seedling mortality. Some areas of these soils are suitable for development of wetland wildlife habitat.

This soil is not suitable for urban development or for recreational uses because of the flooding and ponding and because of the low bearing strength of the soil.

The capability classification is VIIw.

MaC—Macomber-Taconic slaty silt loams, very rocky, sloping. The soils in this complex are on ridgetops in the Taconic Mountains. Slope ranges from 3 to 15 percent but is mainly 6 to 15 percent. The Macomber soil is moderately deep and well drained, and the Taconic soil is shallow and is well drained and somewhat excessively drained. Exposures and ledges of bedrock make up as much as 10 percent of some areas.

This complex is 55 percent Macomber soil, 30 percent Taconic soil, and 15 percent other soils and rock outcrop. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are narrow and irregular in shape and are 10 to 100 acres in size.

Typically, the Macomber soil has an olive brown slaty silt loam surface layer 3 inches thick. The subsoil extends to a depth of 23 inches. It is light olive brown very slaty loam in the upper part and yellowish brown very slaty loam in the lower part. At a depth of 23 inches is folded bedrock.

The Taconic soil typically has a surface layer of dark brown silt loam 5 inches thick. The subsoil extends to a depth of 14 inches. It is olive brown slaty silt loam in the upper part and dark yellowish brown and olive brown very slaty silt loam in the lower part. Folded bedrock is at a depth of 14 inches.

Included with these soils in mapping are small spots of wet soils in seep spots, depressions, and drainageways. Also included are a few areas of soils that are similar to Bernardston and Pittstown soils; these soils are more than 40 inches deep. Areas of included soils make up about 10 percent of this map unit and are as large as 10 acres.

Permeability is moderate in the Macomber soil and moderate or moderately rapid in the Taconic soil. Available water capacity is low in the Macomber soil and low or very low in the Taconic soil. Runoff is slow to medium on both soils. Reaction is strongly acid or very strongly acid. Depth to bedrock is 20 to 40 inches in the Macomber soil and less than 20 inches in the Taconic soil.

This complex is used mainly for woodland and provides habitat for wildlife.

These soils are poorly suited to cultivated crops. Poor accessibility, a short growing season, droughtiness, and exposed bedrock make management difficult. Some areas can be used for hay, but yields are usually low.

These soils are suitable for pasture, but yields are often low because of the droughtiness. Preventing overgrazing and rotational grazing maintain seedings.

Potential productivity for timber is moderately high on the Macomber soil and low on the Taconic soil. Seedling mortality is severe on the Taconic soil because of its droughtiness. Eastern white pine, red pine, white spruce, Norway spruce, and European larch are suitable for planting.

This soil is not suitable for urban and other nonfarm uses because of the limited depth, outcrops of bedrock, and droughtiness.

The capability classification is VIs.

MaE—Macomber-Taconic slaty silt loams, very rocky, steep. The soils in this complex are on side slopes and sides of ridges in the Taconic Mountains. Slope ranges from 15 to 35 percent but is mainly 25 to 35 percent. The Macomber soil is moderately deep and well drained, and the Taconic soil is shallow and is well drained and somewhat excessively drained. Exposures of bedrock make up as much as 10 percent of some areas.

This complex is 65 percent Macomber soil, 20 percent Taconic soil, and 15 percent other soils and rock outcrop. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are broad and irregular in shape and are 10 to 1,000 acres in size.

Typically, the Macomber soil has a surface layer of olive brown slaty silt loam 3 inches thick. The subsoil extends to a depth of 23 inches. It is light olive brown very slaty loam in the upper part and yellowish brown very slaty loam in the lower part. At a depth of 23 inches is folded bedrock.

The Taconic soil typically has a surface layer of dark brown silt loam 5 inches thick. The subsoil extends to a depth of 14 inches. It is olive brown slaty silt loam in the upper part and dark yellowish brown and olive brown very slaty silt loam in the lower part. Folded bedrock is at a depth of 14 inches.

Included with these soils in mapping are small areas of wet soils in seep spots and along drainageways. Areas

of soils that are similar to Bernardston and Pittstown soils are included on foot slopes; these soils are more than 40 inches deep. Also included are small areas of Hoosic soils near the foot slopes; these soils are sandy and gravelly. Areas of included soils make up about 10 percent of this map unit and are as large as 10 acres.

Permeability is moderate in the Macomber soil and moderate or moderately rapid in the Taconic soil. Available water capacity is low to very low in the Taconic soil and low in the Macomber soil. Reaction is strongly acid or very strongly acid in both soils. Depth to bedrock is 20 to 40 inches in the Macomber soil, and less than 20 inches in the Taconic soil.

Most areas of this complex are used for woodland. Most other areas are idle.

These soils are not suitable for cultivated crops because of rock outcrops, droughtiness, steep slope, and a severe erosion hazard. A short growing season and the remoteness of most areas are additional limitations.

These soils have poor suitability for permanent pasture because of steep slope, rock outcrops, and droughtiness. Overgrazing can cause loss of pasture seedings and increase the hazard of erosion. Pasture management is difficult because of the slope and numerous rock outcrops.

Potential productivity for timber is moderately high on the Macomber soil and low on the Taconic soil. Use of harvesting equipment is moderately hindered by the exposed ledges of bedrock and the steepness. Seedling survival is low on the Taconic soil because it is droughty. Constructing logging roads on the contour and using water bars reduce erosion. Eastern white pine, red pine, Norway spruce, white spruce, and European larch are suitable for planting.

These soils are not suitable for urban uses because of the bedrock at or close to the surface and because of the steepness.

The capability classification is VIIs.

MaF—Macomber-Taconic slaty silt loams, very rocky, very steep. The soils in this complex are on side slopes in the Taconic Mountains. Slope ranges from 35 to 60 percent but is mainly 35 to 50 percent. The Macomber soil is moderately deep and well drained, and the Taconic soil is shallow and is well drained to somewhat excessively drained. Exposures of bedrock make up as much as 10 percent of some areas.

This complex is 50 percent Macomber soil, 35 percent Taconic soil, and 15 percent other soils and rock outcrop. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are broad and irregular in shape and generally are 100 to 1,000 acres in size.

Typically, the Macomber soil has a surface layer of olive brown slaty silt loam 3 inches thick. The subsoil extends to a depth of 23 inches. It is light olive brown very slaty loam in the upper part and yellowish brown very slaty loam in the lower part. At a depth of 23 inches is folded bedrock.

The Taconic soil typically has a surface layer of dark brown silt loam 5 inches thick. The subsoil extends to a depth of 14 inches. It is olive brown slaty silt loam in the upper part and dark yellowish brown and olive brown very slaty silt loam in the lower part. Folded bedrock is at a depth of 14 inches.

Included with these soils in mapping are small areas of deep soils that are similar to Bernardston and Pittstown soils; these soils are along drainageways and on foot slopes. Also included are a few small areas of Hoosic soils, which are sandy and gravelly. Areas of included soils make up about 10 percent of this map unit and are as large as 10 acres.

Permeability is moderate in the Macomber soil and moderate or moderately rapid in the Taconic soil. Available water capacity is low in the Macomber soil and low to very low in the Taconic soil. Surface runoff is very rapid in both soils. Reaction is strongly acid or very strongly acid. Depth to bedrock is 20 to 40 inches in the Macomber soil and less than 20 inches in the Taconic soil.

Most areas of this complex are used for woodland and provide wildlife habitat.

These soils are not suitable for cultivation because of the very steep slope, exposed bedrock, and very severe erosion hazard. A short growing season and poor accessibility are additional limitations.

These soils are unsuitable for pasture because of the very steep slope and severe erosion hazard. Operation of farm machinery is very difficult because of slope; therefore, pasture management cannot be applied.

Potential productivity for timber is moderate on the Macomber soil and low on the Taconic soil. Equipment use is severely hindered by the very steep slope and the exposed bedrock. Seedling mortality is slight on the Macomber soil, but it is severe on the Taconic soil because that soil is droughty. Constructing logging roads on the contour and using water bars reduce erosion. Eastern white pine and European larch are suitable for planting.

These soils are not suitable for urban uses because of the very steep slope and because of the bedrock at or near the surface.

The capability classification is VIIs.

MbA—Madalin silt loam, 0 to 3 percent slopes. This nearly level soil is in low depressions. It is deep and is poorly drained to very poorly drained. The areas are narrow strips mostly 3 to 10 acres in size.

Typically, the surface layer is friable, very dark brown silt loam 7 inches thick. The subsurface layer is firm, gray silty clay loam 4 inches thick. The subsoil extends to a depth of 39 inches. It is firm, plastic and slightly sticky, mottled, grayish brown silty clay. The substratum

is firm, dark grayish brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of soils that have a surface layer of very fine sandy loam or a surface layer high in organic matter. On a few slightly higher rises and knolls are areas of Rhinebeck soils, which are somewhat poorly drained. Alluvial soils are included in some valleys. In some areas this soil has gravel and lenses of sand below a depth of 50 inches. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

A seasonal high water table is at or near the surface in spring and during prolonged wet periods. During drier periods in midsummer, the water table is as much as 5 feet below the surface. Permeability is slow in the subsoil. Available water capacity is moderate to high. Runoff is slow, and some areas are often ponded after heavy rains. Reaction is strongly acid to mildly alkaline in the surface layer and medium acid to mildly alkaline in the subsoil. Depth to bedrock is more than 5 feet.

This soil is used mainly for hay and pasture or is idle. Some of the acreage is wooded.

Unless drained, this soil is poorly suited to most crops. The seasonal high water table prevents the land from being tilled until late in spring, and harvest is delayed in fall. The high clay content causes the surface layer to clod and crust if the soil is tilled when wet. Where outlets are available, open ditches and interceptor drains can improve conditions so that some areas can be cultivated. In drained areas, good tilth can be maintained by growing cover crops and sod crops.

This mapping unit is suitable for pasture. Restricting grazing during wet periods and rotational grazing reduce compaction and trampling of the sod. Where outlets are available, open ditches improve the suitability of this soil for pasture.

Potential productivity for timber is low. The wetness causes severe problems in equipment use and severe seedling mortality. The high water table also restricts rooting depth, causing a severe hazard of windthrow. Some areas of this soil are well suited to development of wetland wildlife habitat.

This soil is not suitable for urban development because of the prolonged high water table, frequent flooding, and slow permeability in the subsoil.

The capability classification is IVw.

NaB—Nassau-Manlius complex, undulating. The soils of this complex are on gently sloping ridges that are underlain by shale or slate bedrock. Slope ranges from 1 to 8 percent. Texture of the surface layer is slaty loam to very shaly silt loam. The Nassau soil is shallow and somewhat excessively drained. The Manlius soil is moderately deep and well drained.

This complex is 45 percent Nassau soil, 30 percent Manlius soil, and 25 percent other soils. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are irregular in shape and are 3 to 50 acres in size.

Typically, the surface layer of the Nassau soil is very friable, dark brown very shaly silt loam 7 inches thick. The subsoil is friable, yellowish brown very shaly loam to a depth of 15 inches. Folded shale is below a depth of 15 inches.

Typically, the surface layer of the Manlius soil is very friable, brown shaly silt loam 8 inches thick. The subsoil is very shaly silt loam to a depth of 23 inches. The upper part of the subsoil is yellowish brown, and the lower part is dark yellowish brown. The substratum is dark yellowish brown very shaly silt loam. Folded, olive gray shale is below a depth of 30 inches.

Included with these soils in mapping are small areas of Bernardston, Hudson, Rhinebeck, Scriba, Carlisle, and Palms soils. Bernardston soils are deep and well drained. Hudson and Rhinebeck soils are clayey. Scriba soils are somewhat poorly drained and are in small, shallow depressions. Carlisle and Palms soils are mucks and are in deeper depressions. Exposures of folded bedrock are on some ridgetops. In some areas the soils are underlain by sandstone bedrock. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

Bedrock is at a depth of 10 to 20 inches in the Nassau soil and 20 to 40 inches in the Manlius soil. Rooting depth is limited by the bedrock. Permeability is moderate in both soils. Available water capacity is very low in the Nassau soil and very low to moderate in the Manlius soil. Runoff is medium on both soils. In unlimed areas, reaction is strongly acid or very strongly acid in the Nassau soil and strongly acid to extremely acid in the upper part of the Manlius soil.

A large acreage of this unit is wooded or idle. Some areas are used for pasture and crops.

These soils are suitable for cultivated crops. Occasional rock outcrops and droughtiness are the chief limitations. Erosion is a moderate hazard, particularly where slopes are long. Cover crops, cropping systems that have a high proportion of sod crops, minimum tillage, and crop residue returned to the soil reduce the erosion hazard, conserve soil moisture, improve organic matter content, and maintain tilth. Shale fragments interfere with seeding and some tillage operations and can cause excessive wear of machinery. Droughtiness is usually a more severe problem on the Nassau soil than on the Manlius soil.

This unit is suited to hay and pasture, although droughtiness generally causes yields to be low. Overgrazing during dry periods can cause loss of the pasture seeding and lead to erosion. Proper seeding rates to maintain key plant species, rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is low on the Nassau soil and moderately high on the Manlius soil. Seedling mortality is severe on the Nassau soil because it is

shallow and droughty. Mortality is only slight on the Manlius soil. Occasional rock outcrops and the fragments of shale can interfere with machine planting. Running logging roads on the contour where possible helps to prevent erosion. Eastern white pine, red pine, and European larch are suitable for planting.

These soils are not suitable for many urban uses because of the shallowness, occasional rock outcrops, shale fragments in the soil, and droughtiness. Some areas are suitable for certain recreational uses.

The capability classification is IIIe.

NaC—Nassau-Manlius complex, rolling. The sloping soils in this complex are on the sides of ridges that are underlain by shale or slate bedrock. Slope ranges from 5 to 16 percent. The Nassau soil is shallow and somewhat excessively drained. The Manlius soil is moderately deep and well drained.

This complex is 45 percent Nassau soil, 25 percent Manlius soil, and 30 percent other soils. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are irregular in shape and are 10 acres to more than 100 acres in size.

Typically, the surface layer of the Nassau soil is very friable, dark brown very shaly silt loam 7 inches thick. The subsoil is friable, yellowish brown very shaly loam to a depth of 15 inches. Folded shale is below a depth of 15 inches.

The Manlius soil typically has a very friable, brown shaly silt loam surface layer 8 inches thick. The subsoil is very shaly silt loam to a depth of 23 inches. The upper part of the subsoil is yellowish brown, and the lower part is dark yellowish brown. The substratum is dark yellowish brown very shaly silt loam. Folded, olive gray shale is below a depth of 30 inches.

Included with this soil in mapping are small areas of Bernardston, Hudson, Rhinebeck, Scriba, Carlisle, and Palms soils. Bernardston soils are deep and well drained. Hudson and Rhinebeck soils are clayey. Scriba soils are somewhat poorly drained and are in small, shallow depressions. Carlisle and Palms soils are mucks and are in deeper depressions. Exposures of folded bedrock are in some places. In some areas the soils are underlain by sandstone bedrock. Areas of included soils make up about 30 percent of this map unit and are as large as 3 acres.

Bedrock is at a depth of 10 to 20 inches in the Nassau soil and 20 to 40 inches in the Manlius soil. Rooting depth is limited by the bedrock. Permeability is moderate in both soils. Available water capacity is very low in the Nassau soil, and very low to moderate in the Manlius soil. Runoff is medium to rapid. In unlimed areas, reaction is strongly acid or very strongly acid in the Nassau soil and strongly acid to extremely acid in the upper part of the Manlius soil.

Large areas of this unit are wooded. Other areas are used for hay, crops, or pasture. Some areas that were formerly cropped are now idle.

These soils are suitable for cultivated crops. Occasional rock outcrops and droughtiness are limitations. Rock outcrops, shale fragments, and shallow depth in some areas impede the use of equipment and cause excessive wear of machinery. Erosion is a serious hazard and is difficult to control because of the rolling topography. Crossslope tillage where practical, cover crops, crop rotation, conservation tillage, and crop residue returned to the soil reduce erosion, conserve soil moisture, maintain organic matter content, and improve tilth.

These soils are suitable for pasture and hay. Overgrazing weakens the plant cover and increases the hazard of severe erosion. Proper seeding rates to maintain key plant species, rotational grazing, annual mowing, and lime and fertilizer are needed. Droughtiness generally causes yields to be low.

Potential productivity for timber is moderately high on the Manlius soil and low on the Nassau soil. Seedling mortality is severe on the Nassau soil because it is shallow and droughty. Mortality is only slight on the Manlius soil. Occasional rock outcrops, the shale fragments, and the rolling topography interfere with machine planting. Running logging roads on the contour where possible and using water bars help to control erosion and gullying. Eastern white pine, red pine, and European larch are suitable for planting.

These soils are unsuitable for many urban uses because of the limited depth to bedrock, the slope, and the occasional rock outcrops. Some areas are suitable for certain recreational uses.

The capability classification is IVe.

NrC—Nassau-Rock outcrop complex, rolling. This complex consists of Nassau soils and numerous outcrops of bedrock on ridges on the glaciated uplands. Slope ranges from 1 to 16 percent but is mostly 5 to 16 percent. The Nassau soil is shallow and somewhat excessively drained.

This complex is 40 percent Nassau soil, 30 percent Rock outcrop, and 30 percent other soils. The areas of soil and those of Rock outcrop are so intermingled that they could not be mapped separately. The areas of this complex are generally elongated, running north and south, and are 3 to 400 acres in size.

Typically, the surface layer of the Nassau soil is very friable, dark brown very shaly silt loam 7 inches thick. The subsoil is friable, yellowish brown very shaly loam to a depth of 15 inches. Folded shale is below a depth of 15 inches.

Rock outcrop consists of exposures of folded shale, slate, and sandstone.

Included in mapping are small spots of Manlius soils, which are moderately deep, and small areas where the

soil material is only 1 to 10 inches deep over bedrock. Also included are small areas of Bernardston, Alden, and Palms soils. Bernardston soils are deep. Alden and Palms soils are very poorly drained and are in depressions. Areas of included soils make up about 30 percent of this map unit and are as large as 3 acres.

In the Nassau soil, bedrock is at a depth of 10 to 20 inches. Rooting depth is limited by the bedrock. Permeability is moderate. Available water capacity is very low. Runoff is medium to rapid. In unlimed areas, reaction is strongly acid or very strongly acid.

A large acreage of this map unit is wooded. Some areas are used for pasture.

The areas are not suited to cultivated crops. The rolling topography and numerous exposures of bedrock are the main limitations for cultivation and safe operation of farm machinery. Numerous shale fragments, shallow rooting depth, and droughtiness are also serious limitations.

The Nassau soil can be used for permanent pasture, but management is difficult because of the numerous rock outcrops. Overgrazing can cause loss of vegetation, which increases the hazard of excessive soil erosion. Proper seeding rates and rotational grazing are needed. Droughtiness generally causes yields to be low.

Potential productivity for timber is low. Seedlings have to be planted by hand in most areas. Seedling mortality is severe because of droughtiness. Running logging roads on the contour where possible and using water bars help to control erosion. Eastern white pine, red pine, and European larch are suitable for planting.

Urban development is severely limited by the rock outcrops, shallowness, and rolling topography.

The capability classification is VIs.

NrD—Nassau-Rock outcrop complex, hilly. This complex consists of Nassau soil and numerous outcrops of bedrock on the sides of ridges on the uplands. Slope ranges from 16 to 50 percent. The Nassau soil is shallow over bedrock and is somewhat excessively drained.

The complex is 40 percent Nassau soil, 35 percent Rock outcrop, and 25 percent other soils. The areas of soil and those of Rock outcrop are so intermingled that they could not be mapped separately. The areas of this complex are irregular in shape and range from 20 to 400 acres in size.

Typically, the surface layer of the Nassau soil is very friable, dark brown very shaly silt loam 7 inches thick. The subsoil is friable, yellowish brown very shaly loam to a depth of 15 inches. Folded shale is below a depth of 15 inches.

Rock outcrop consists of exposures of folded shale, slate, and sandstone.

Included in mapping are small areas of Bernardston, Manlius, Alden, and Palms soils and spots where the soil material is only 1 to 10 inches thick. Bernardston soils are deep, and Manlius soils are moderately deep. Alden and Palms soils are in depressions; they are very poorly drained. Also included in the towns of Stephentown and Hoosick are areas of soils that are underlain by dolomitic limestone. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

In the Nassau soil, bedrock is at a depth of 10 to 20 inches. Rooting depth is limited by the bedrock. Permeability is moderate. Available water capacity is very low. Runoff is rapid to very rapid. In unlimed areas, reaction is strongly acid or very strongly acid.

Most areas are wooded, and a small acreage is in marginal pasture.

The areas are not suitable for cultivation because of the exposed rock, moderately steep slope, and droughtiness.

Suitability for permanent pasture is poor because of droughtiness, moderately steep slope, and the numerous rock outcrops. Overgrazing on the steep soil weakens the pasture seeding and increases the hazard of erosion. Proper seeding rates and rotation of pasture are needed.

Potential productivity for timber is low. The rock outcrops and moderately steep slope hinder use of equipment. Running logging roads on the contour where possible and using water bars help to control excessive erosion. Because of droughtiness, seedling mortality is severe and growth is slow. Eastern white pine and red pine are suitable for planting.

These areas are not suitable for urban uses because of the shallowness, numerous rock outcrops, slope, and droughtiness. Some areas are suitable for some recreational uses.

The capability classification is VIIs.

ObA—Occum Variant-Barbour Variant complex, 0 to 3 percent slopes. The soils in this complex are on flood plains in the eastern part of the county. The Occum variant soil is deep and moderately well drained, and the Barbour variant soil is deep and well drained.

This complex is 45 percent Occum variant soil, 35 percent Barbour variant soil, and 20 percent other soils. The individual soils are so intermingled that they could not be mapped separately. The areas of this complex are long and narrow along small streams and broad and irregular in shape along the Little Hoosic River and Kinderhook Creek. These areas range from 3 to 60 acres in size.

Typically, the Occum variant soil has a friable, dark grayish brown silt loam surface layer 8 inches thick. The subsoil extends to a depth of 30 inches. The upper part of the subsoil is very friable, light olive brown silt loam; the middle part is very friable, brown sandy loam; and the lower part is mottled, gray fine sandy loam. The substratum is dark grayish brown and brown very gravelly loamy sand to a depth of 60 inches or more.

The Barbour variant soil typically has a dark brown silt loam surface layer 9 inches thick. The subsoil extends to

a depth of 35 inches. The upper part of the subsoil is dark yellowish brown silt loam and yellowish brown loam, and the lower part is brown fine sandy loam and silt loam. The substratum is brown very gravelly loamy sand to a depth of more than 60 inches.

Included with these soils in mapping are spots of somewhat poorly drained and poorly drained soils along drainageways and in depressions. Hoosic, Chenango, and Haven soils are included in higher areas. Also included are a few areas of shallow soils. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

These soils are subject to flooding, particularly in spring. The Occum variant soil is generally flooded more frequently than the Barbour variant soil. In winter and spring, a seasonal high water table is at a depth of 1.5 to 3 feet in the Occum variant soil and 3 to 6 feet in the Barbour variant soil. Permeability is moderate in the subsoil and rapid in the substratum in both soils. Available water capacity is moderate to high. Runoff is slow. In unlimed areas, reaction is strongly acid or medium acid throughout. Depth to bedrock is more than 60 inches.

Most areas of this complex are used for corn, hay, and grain.

These soils are suited to most crops grown in the area. The major limitations are brief seasonal wetness and occasional or frequent flooding in spring. Stream gouging and gravel deposition can be problems in some places. These soils are quite easy to till at the proper moisture content.

These soils are suited to pasture. However, grazing should be restricted during spring and other wet periods to prevent soil compaction. Rotational grazing, annual mowing, and lime and fertilizer are important.

Potential productivity for woodland is high. Seasonal wetness is a minor problem in management. Seedling mortality and windthrow are not generally problems. Eastern white pine, Norway spruce, and white spruce are suitable for planting.

These soils are poorly suited to most urban uses because of the flooding. Brief seasonal wetness in the Occum variant soil and rapid permeability in the substratum of both soils also limit such uses as septic tank absorption fields.

The capability classification is IIw.

PaA—Palms muck, 0 to 1 percent slopes. This nearly level organic soil is in low bogs or swamps that receive runoff from surrounding areas. This soil is very poorly drained. The areas are irregular in shape and are generally 10 to 50 acres in size.

Typically, the surface layer is friable, black muck 4 inches thick. The subsurface layer is slightly plastic and sticky, dark reddish brown muck to a depth of 18 inches. The substratum extends to a depth of 60 inches or more. It is dark gray silt loam in the upper part and gray fine sandy loam in the lower part.

Included with this soil in mapping are areas of soils in which the organic layer is less than 16 inches thick and areas of soils that have bedrock at a depth of as little as 20 inches. Also included in the center of large depressions are areas of Carlisle muck, which is deep. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

The water table is at or near the surface for much of the year. Many areas are flooded or ponded in spring. Rooting depth is restricted by the high water table. Runoff is ponded or very slow. Permeability is moderately slow to moderately rapid in the organic layers and moderately slow or moderate in the mineral substratum. Reaction is strongly acid to mildly alkaline throughout the organic layer. Depth to bedrock is more than 5 feet.

This soil generally is wooded or is idle.

This soil is not suited to cultivated crops unless drained. It is well suited to high value truck and specialty crops if adequate drainage is provided. After drainage, subsidence and wind erosion can be problems. Wind erosion can be reduced by planting windbreaks. Subsidence can be minimized by maintaining a high water table between growing seasons. Many areas of this soil are in frost pockets.

This soil is generally not suitable for pasture. Animal hoofs puncture and compact the organic surface layer and trample seedings.

Potential productivity for timber is moderately low. The prolonged high water table severely limits the species that will survive. Use of machinery is severely limited. The wetness also causes severe seedling mortality and restricts root development, leading to windthrow during windy periods. Many areas of this soil are well suited to the development of wetland wildlife habitat.

This soil is not suitable for nonfarm uses because of the high water table, flooding and ponding, and compressibility of the organic material.

The capability classification is IVw.

Pg—Pits, gravel. This map unit consists of areas that have been excavated for sand or gravel for use in construction. Most of these excavations are in deposits of glacial outwash but some are in loose, sandy glacial till. The pits are 3 to 50 feet deep with steep sides and a relatively level bottom. Stones and boulders are commonly scattered over the pit floor. The areas are generally irregular in shape and are 5 to 80 acres in size.

Included in this map unit are small areas where bedrock has been exposed. Small areas of loamy and clayey materials are piled on the floor of some pits. Some gravel pits have small pools of water and other pits have been partially reclaimed by adding salvaged topsoil.

Permeability is variable but usually is moderately rapid to very rapid. Available water capacity is very low, and conditions are generally droughty. Reaction is dominantly extremely acid to strongly acid throughout.

The suitability of this miscellaneous map unit for any use must be determined by investigation of each site.

These areas usually have poor suitability for farming because of the very low moisture content and a high content of gravel and cobblestones. Pasture and woodland also are limited by the droughtiness.

This unit has limited suitability for most urban uses. Droughtiness makes establishing vegetation difficult. Ground water can be polluted by effluent from septic systems.

No capability classification is assigned.

PtB—Pittstown gravelly silt loam, 3 to 8 percent slopes. This gently sloping soil is on hilltops, lower hillsides, and hillcrests on the uplands. This soil is deep and moderately well drained. The areas are oval or irregular in shape and are generally 3 to 20 acres in size.

Typically, the surface layer is very friable, very dark grayish brown gravelly silt loam 9 inches thick. The subsoil is friable and extends to a depth of 24 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is mottled, light olive brown gravelly silt loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is firm and very brittle, mottled, olive gravelly silt loam.

Included with this soil in mapping are areas of Bernardston, Albrights, Scriba, Alden, Nassau, and Manlius soils. Bernardston soils are well drained, and Albrights soils are moderately well drained. Scriba soils are somewhat poorly drained, and Alden soils are very poorly drained; these soils are in depressions and drainageways. Nassau soils are shallow, and Manlius soils are moderately deep. Also included are some areas of soils in which the substratum is moderately alkaline below a depth of 40 inches. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

In spring and during wet periods, a temporary seasonal high water table is perched above the fragipan. Rooting depth is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate. Runoff is medium. In unlimed areas, reaction is very strongly acid to medium acid throughout the soil. Depth to bedrock is more than 60 inches.

Many areas of this soil are used for crops, hay, and pasture for dairy farms (fig. 7).

This soil is suited to most crops grown in the area. Erosion is a slight hazard and can be reduced by standard management practices such as crop rotation, contour tillage, cover crops, and crop residue incorporated into the soil. These practices also improve tilth and maintain organic matter content. Seasonal wetness can delay tillage early in spring and harvest in fall. Draining wet spots improves the suitability of many fields.

This soil is suited to pasture. Preventing overgrazing, especially during spring and other wet periods, helps to prevent soil compaction and loss of the seeding. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for woodland is moderately high. Controlling brush and weeds reduces competition and improves seedling survival. Trees can be planted by machine in most areas. Norway spruce, white spruce, European larch, and eastern white pine are suitable for general planting.

Most urban uses are limited by the slowly permeable fragipan and the seasonal high water table.

The capability classification is IIw.

PtC—Pittstown gravelly silt loam, 8 to 15 percent slopes. This sloping soil is on hillsides and valley sides on the uplands. It is deep and moderately well drained. The areas are oval or irregular in shape and are generally 3 to 20 acres in size.

Typically, the surface layer is very friable, very dark grayish brown gravelly silt loam 9 inches thick. The subsoil is friable and extends to a depth of 24 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is mottled, light olive brown gravelly silt loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is firm and very brittle, mottled, olive gravelly silt loam.

Included with this soil in mapping are areas of Bernardston, Albrights, Scriba, Alden, Nassau, and Manlius soils. Bernardston soils are well drained, and Albrights soils are moderately well drained. Scriba soils are somewhat poorly drained, and Alden soils are very poorly drained; these soils are in depressions and drainageways. Nassau soils are shallow, and Manlius soils are moderately deep. Also included are some areas of soils in which the substratum is moderately alkaline below a depth of 40 inches. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

In spring and during other wet periods, a temporary water table is perched above the fragipan. Rooting depth is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate. Runoff is medium to rapid. In unlimed areas, reaction is very strongly acid to medium acid throughout the soil. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for crops, hay, and pasture for dairy farms. Some areas are wooded.

This soil is suited to many of the crops grown in the area. Erosion is a moderate hazard but can be controlled by such practices as crop rotation, contour tillage, cover crops, conservation tillage, and crop residue

Figure 7.—Many areas of Pittstown gravelly silt loam, 3 to 8 percent slopes, are used for crops on dairy farms.

incorporated into the soil. These practices also improve tilth and maintain organic matter content. Seasonal wetness can slightly delay tillage early in spring and harvest in fall. Interceptor drains above included wet spots improve the suitability of many fields.

This soil is suited to pasture. Overgrazing, especially during spring and other wet periods, can cause soil compaction and loss of the pasture seedings. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for woodland is moderately high. Removing brush and weeds reduces competition and improves seedling survival. Running logging roads on the contour and using water bars reduce erosion. Trees can be planted by machine in most areas. Norway spruce, white spruce, eastern white pine, and European larch are suitable for general planting.

Urban uses are limited by the slowly permeable fragipan, slope, and the seasonal high water table.

The capability classification is IIIe.

PuC—Pittstown-Bernardston association, very stony, sloping. The soils of this association are on foot slopes and toe slopes of the Taconic Mountains. The Pittstown soils are in slightly concave areas, and the Bernardston soils are in slightly convex areas. The Bernardston soils are generally in higher positions and are somewhat steeper than the Pittstown soils. Slope ranges from 3 to 15 percent but is mostly 6 to 15 percent. The Pittstown soils are deep and moderately well drained; the Bernardston soils are deep and well drained. Many large stones are on the surface about 5 to 30 feet apart.

This association is about 55 percent Pittstown soils, 35 percent Bernardston soils, and 10 percent other soils. The areas of this association are irregular in shape and are 10 to 150 acres in size.

Typically, the Pittstown soils have a very friable, very dark grayish brown gravelly silt loam surface layer 9 inches thick. The subsoil is friable and extends to a depth of 24 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is mottled, light olive brown gravelly silt loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is firm and very brittle, mottled, olive gravelly silt loam.

Typically, the Bernardston soils have a friable, brown gravelly silt loam surface layer 8 inches thick. The subsoil is friable and extends to a depth of 30 inches. The upper part of the subsoil is yellowish brown gravelly

silt loam, and the lower part is dark yellowish brown and dark brown gravelly loam. The substratum is a dense fragipan that extends to a depth of 60 inches or more. It is very firm, mottled, light olive brown gravelly loam.

Included with these soils in mapping are areas of Hoosic, Taconic, Macomber, and Scriba soils. Hoosic soils are gravelly and sandy. Taconic soils are shallow, and Macomber soils are moderately deep. Scriba soils are somewhat poorly drained and are in wet spots along drainageways and in depressions. Also included are a few small areas of soils in which the subsoil has a high content of clay. Some areas of these soils do not have stones on the surface. Areas of included soils make up about 10 percent of this map unit and are as large as 10 acres.

In spring and during wet periods, a water table is temporarily perched above the fragipan in both the Pittstown and the Bernardston soils. Rooting depth is somewhat restricted by the dense fragipan. Permeability is moderate above the fragipan and slow in it. Available water capacity is moderate. Surface runoff is medium to rapid. Reaction ranges from very strongly acid to medium acid throughout. Depth to bedrock is more than 60 inches.

Most areas of this association are wooded or are idle. Some areas are used for unimproved pasture.

These soils are not suited to cultivation because of the many large stones on the surface and poor accessibility in most areas. Because they are at high elevations, the soils warm late in spring; as a result, the growing season is too short for most of the crops commonly grown at lower elevations. Included seep spots and drainageways are too wet for cultivation.

These soils are suitable for pasture. Poor accessibility makes management difficult in some areas, and the large stones on the surface impede management practices such as annual mowing and reseeding.

Potential productivity for woodland is moderately high on the Pittstown soils and moderate on the Bernardston soils. Use of equipment is limited slightly by the numerous large stones on the surface and by the seasonal wetness. Norway spruce, white spruce, European larch, and eastern white pine are suitable for planting.

These soils are poorly suited to most urban uses because of poor accessibility, the temporary high water table, and the slowly permeable fragipan.

The capability classification is VIs.

RaA—Raynham silt loam, 0 to 5 percent slopes. This nearly level soil is in depressional areas. It has a high content of silt and very fine sand. This soil is deep and is somewhat poorly drained to poorly drained. In most areas slope is less than 3 percent. The areas are irregular in shape and are generally 3 to 20 acres in size.

Typically, the surface layer is very friable, dark grayish brown silt loam 14 inches thick. The subsoil is friable and mottled and extends to a depth of 26 inches. The upper part of the subsoil is pale brown silt loam, and the lower part is grayish brown loam. The substratum is firm, light olive gray silt loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Unadilla, Scio, Rhinebeck, and Madalin soils. Unadilla soils are well drained, and Scio soils are moderately well drained; they are in higher areas. Rhinebeck soils are somewhat poorly drained, and Madalin soils are poorly drained and very poorly drained; they have more clay in the subsoil than this Raynham soil. Also included are spots of soils that have layers of loamy fine sand below a depth of 40 inches. In some small areas, slope is more than 5 percent. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

A seasonal high water table is 6 to 24 inches below the surface during wet periods and recedes to a depth of more than 4 feet during dry periods. Rooting depth is controlled by the water table. Permeability is moderate or moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Runoff is slow. Reaction is strongly acid to neutral in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

Most areas of this soil are used for hay or pasture. Some areas are used for cultivated crops such as corn.

This soil is suitable for cultivated crops. The seasonal high water table delays planting in spring and restricts the choice of crops. Drainage is needed for best crop growth. Standard management practices—such as conservation tillage, cover crops, crop residue incorporated into the soil, tillage at the proper soil moisture content, and crop rotation—improve tilth and maintain organic matter content.

This soil is suitable for pasture. Because of the seasonal high water table, grazing is generally limited to summer and early fall. Restricting grazing when conditions are too wet and rotational grazing prevent soil compaction and loss of pasture seedings. Drainage improves suitability of this soil for pasture.

Potential productivity for timber is moderate. Seasonal wetness increases seedling mortality and severely hinders equipment use. The seasonal high water table also restricts root growth, allowing strong winds to uproot trees. White spruce, eastern white pine, northern white-cedar, and European larch are suitable for planting.

This soil is not suitable for urban uses because of the seasonal high water table and the slow permeability in the substratum.

The capability classification is IIIw.

RhA—Rhinebeck silt loam, 0 to 3 percent slopes. This nearly level soil is in flat areas in the Hudson River valley. It formed in silt and clay deposits. This soil is deep and somewhat poorly drained. Most areas are broad and irregular in shape and are 5 to 40 acres in size.

Typically, the surface layer of this soil is friable, dark grayish brown silt loam 8 inches thick. The subsurface layer is firm, mottled, light brownish gray silty clay loam 3 inches thick. The subsoil extends to a depth of 36 inches. The upper part of the subsoil is firm, mottled, brown silty clay; and the lower part is firm, mottled, dark grayish brown silty clay. The substratum is firm, mottled, dark grayish brown silty clay loam to a depth of more than 62 inches.

Included with this soil in mapping are areas of Hudson, Madalin, and Nassau soils. Hudson soils are moderately well drained and are in slightly convex areas. Madalin soils are poorly drained and very poorly drained and are in depressions. Nassau soils are shallow and are in the uplands. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

In spring and during wet periods, the water table is perched above the slowly permeable subsoil; the water table is at a depth of 6 to 18 inches. During dry periods it lowers to a depth of more than 5 feet. Rooting depth is somewhat restricted by the seasonal high water table. Permeability is moderately slow in the surface and subsurface layers and slow in the subsoil. Available water capacity is moderate to high. Runoff is slow. In unlimed areas reaction is strongly acid to neutral in the surface layer and strongly acid to mildly alkaline in the subsoil. Depth to bedrock is more than 5 feet.

Many areas of this soil are used for hay or pasture.

If drained, this soil is suited to many crops. Runoff from adjacent soils accumulates on this nearly level soil for short periods. Drainage is difficult because of the slowly permeable subsoil and lack of readily available outlets. Wetness delays planting in spring and harvesting in fall. If tilled at a high moisture content, the soil clods and puddles easily and is difficult to manage. Standard management practices—such as cover crops, crop rotation, crop residue incorporated into the soil, and tillage at proper moisture content—improve tilth and maintain organic matter content. Alfalfa can be damaged by frost action unless the soil is drained.

This soil is suited to pasture. Grazing should be restricted during wetter periods to avoid trampling of the pasture and compaction of the soil. Rotational grazing, annual mowing, and surface drainage are important.

Potential productivity for timber is moderately high. Trees can be planted by machine, but planting may be delayed in spring by wetness. Norway spruce, white spruce, white pine, and European larch are suitable for planting.

This soil is not suitable for urban uses because of the seasonal wetness and the slow permeability. Frost heave can also cause serious problems.

The capability classification is IIIw.

RhB—Rhinebeck silt loam, 3 to 8 percent slopes. This gently sloping soil is in smooth, slightly concave areas in the Hudson River valley. It formed in silt and clay deposits. This soil is deep and somewhat poorly drained. The areas are long and broad or irregular in shape. They are 5 to 40 acres in size.

Typically, the surface layer of this soil is friable, dark grayish brown silt loam 8 inches thick. The subsurface layer is firm, mottled, light brownish gray silty clay loam 3 inches thick. The subsoil extends to a depth of 36 inches. The upper part of the subsoil is firm, mottled, brown silty clay; and the lower part is firm, mottled, dark grayish brown silty clay. The substratum is firm, mottled, dark grayish brown silty clay loam to a depth of more than 62 inches.

Included with this soil in mapping are areas of Hudson, Madalin, and Nassau soils. Hudson soils are moderately well drained and are on convex knolls. Madalin soils are poorly drained and very poorly drained and are in depressions. Nassau soils are shallow and are in the uplands. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

In spring and during other wet periods, the water table is perched above the slowly permeable subsoil; the water table is at a depth of 6 to 18 inches at those times. During dry periods it lowers to a depth of more than 5 feet. Rooting depth is somewhat restricted by the seasonal high water table. Permeability is moderately slow in the surface and subsurface layers and slow in the subsoil. Available water capacity is moderate to high. Runoff is medium. In unlimed areas, reaction is strongly acid to neutral in the surface layer and strongly acid to mildly alkaline in the subsoil. Depth to bedrock is more than 5 feet.

Many areas of this soil are used for crops, hay, and pasture.

If drained, this soil is suited to many crops. Proper drainage is often difficult because of the slowly permeable subsoil. Without drainage, wetness delays planting in spring and shortens the harvest period in fall. If this soil is tilled at a high moisture content, it clods and puddles easily. This gently sloping soil is subject to severe erosion if left bare of cover for extended periods. Grassed waterways and diversion ditches control excess runoff and protect the soil from erosion. Standard management practices—such as cross-slope tillage, cover crops, crop rotation, crop residue incorporated into the soil, and tillage at proper moisture content—reduce erosion, improve tilth, and maintain organic matter content. Alfalfa can be damaged by frost action and should not be planted unless the soil is drained.

This soil is suited to pasture. Grazing should be restricted during wetter periods to prevent loss of pasture seedings and soil compaction. Drainage improves suitability of this soil for pasture in the spring. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is moderately high. Seedlings can be planted by machine, but planting may be delayed in spring by wetness. Norway spruce, white

spruce, white pine, and European larch are suitable for planting.

This soil is not suitable for urban uses because of the seasonal wetness and the slow permeability. Frost heaving can also cause serious problems for many uses.

The capability classification is IIIw.

RkA—Riverhead fine sandy loam, 0 to 3 percent slopes. This nearly level soil formed in glacial outwash that has a high content of sand and gravel. The landscape is flat. This soil is deep and well drained. The areas are long and irregular in shape and are generally 3 to 25 acres in size.

Typically, the surface layer is friable, dark grayish brown fine sandy loam 6 inches thick. The subsoil extends to a depth of 35 inches. The upper part of the subsoil is friable, yellowish brown sandy loam, and the lower part is friable, dark yellowish brown sandy loam. The substratum is loose, brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Haven, Chenango, and Hoosic soils. Haven soils have less sand and more silt in the subsoil than this Riverhead soil. Chenango soils are well drained, and Hoosic soils are somewhat excessively drained. Also included are a few areas of soils in which the underlying stratified sand and gravel is less than 22 inches below the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid in the subsoil and very rapid in the substratum. Available water capacity is moderate to low. Runoff is slow. In unlimed areas, reaction is extremely acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

This soil is used mainly for row crops, hay, and pasture.

This soil is suited to most crops commonly grown in the area. Droughtiness is a problem in many years, and irrigation can increase yields. Conservation tillage, cover crops, crop rotation, and crop residue returned to the soil improve tilth, increase organic matter content, and improve available water capacity of the soil.

This soil is suitable for pasture. Rotational grazing, yearly mowing, and avoidance of overgrazing during dry periods are needed.

Potential productivity for timber is moderately high. Removing brush and incorporating organic material into the soil reduces the droughtiness and improves seedling survival. Norway spruce, white spruce, red pine, eastern white pine, and European larch are suitable for planting.

This soil has few limitations for urban use. Effluent from septic systems can pollute ground water because water moves very rapidly through the substratum. This soil is a probable source of sand and gravel.

The capability classification is IIs.

RkB—Riverhead fine sandy loam, 3 to 8 percent slopes. This gently sloping soil formed in glacial outwash that has a high content of sand and gravel. This soil is deep and well drained. The areas are broad and generally are 3 to 20 acres in size.

Typically, the surface layer is friable, dark grayish brown fine sandy loam 6 inches thick. The subsoil extends to a depth of 35 inches. The upper part of the subsoil is friable, yellowish brown sandy loam, and the lower part is friable, dark yellowish brown sandy loam. The substratum is loose, brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Haven, Chenango, and Hoosic soils. Haven soils have less sand and more silt in the subsoil than this Riverhead soil. Chenango soils are well drained to somewhat excessively drained, and Hoosic soils are somewhat excessively drained. Also included are a few areas of soils in which the underlying stratified sand and gravel is less than 22 inches below the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid in the subsoil and very rapid in the substratum. Available water capacity is moderate to low. Runoff is medium. In unlimed areas, reaction is extremely acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

This soil is used mainly for row crops, hay, and pasture.

This soil is suitable for most crops grown in the area. Droughtiness is a problem during dry periods. Irrigation can increase productivity, but the slope can cause design and application problems and increase the hazard of erosion. This soil is more difficult to irrigate than the nearly level Riverhead soil. Contour tillage, cover crops, crop rotation, conservation tillage, and crop residue returned to the soil improve tilth and increase available water capacity of the soil.

The soil is suitable for pasture. Rotational grazing, annual mowing, and stocking the proper number of animals per acre help to prevent overgrazing. Grazing during dry periods can result in loss of desirable pasture plants.

Potential productivity for timber is moderately high. Removing brush and incorporating organic material into the soil can reduce the droughtiness that increases seedling mortality. Erosion can be a problem along logging roads on long slopes. White pine, red pine, Norway spruce, white spruce, and European larch are suitable for planting.

This soil is suited to most urban uses. This soil may require more grading than the nearly level Riverhead soil. Effluent from septic systems can p[illegible]te the ground water because water moves very rapidly through the substratum. This soil is a probable source of sand and gravel.

The capability classification is IIe.

RkC—Riverhead fine sandy loam, rolling. This soil formed in glacial outwash that has a high content of sand and gravel. Slope ranges from 8 to 15 percent. This soil is deep and well drained. The areas are narrow to medium-wide strips and generally are 3 to 20 acres in size.

Typically, the surface layer is friable, dark grayish brown fine sandy loam 6 inches thick. The subsoil extends to a depth of 35 inches. The upper part of the subsoil is friable, yellowish brown sandy loam, and the lower part is friable, dark yellowish brown sandy loam. The substratum is loose, brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Haven, Chenango, Hoosic, and Windsor soils. Haven soils have less sand and more silt in the subsoil than this Riverhead soil. Chenango soils are well drained to somewhat excessively drained, and Hoosic soils are somewhat excessively drained. Windsor soils are sandy and excessively drained. Also included are a few areas of soils in which the underlying stratified sand and gravel is less than 22 inches below the surface. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

Permeability is moderately rapid in the subsoil and very rapid in the substratum. Available water capacity is moderate to low. Runoff is medium to rapid. In unlimed areas, reaction is extremely acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

Most areas of this soil are used for row crops, hay, and pasture.

This soil is suited to most crops grown in the area. Erosion can be a serious hazard. Cross-slope tillage, cover crops, crop rotation, conservation tillage, and crop residue returned to the soil reduce erosion, increase organic matter content, and promote good tilth. The rolling topography reduces the effectiveness of crossslope tillage and stripcropping. During dry periods, droughtiness is often a problem.

This soil is suitable for pasture. Overgrazing can cause loss of pasture seedings and result in soil erosion, particularly during dry periods. Proper seeding rates to maintain key plant species, rotational grazing, yearly mowing, and lime and fertilizer are needed.

Potential productivity for timber is moderately high. Erosion can be a hazard along skid trails, particularly where slopes are long. Constructing logging roads on the contour reduces erosion. Planting early in spring reduces the seedling mortality caused by droughtiness. White pine, red pine, Norway spruce, white spruce, and European larch are suitable for planting.

This soil is suitable for urban development where the rolling topography can be managed for erosion control. The very rapid movement of water through the substratum can allow pollution of the ground water by effluent from waste disposal systems.

The capability classification is IIIe.

Sa—Saprists and Aquents, ponded. These nearly level soils are in areas bordering lakes, ponds, and other open bodies of water (fig. 8). These areas are covered with shallow water. The water level fluctuates with the level of the adjacent open water. Most areas are in natural depressions, although some areas have been developed by man. The soils are deep and very poorly drained. Slope ranges from 0 to 1 percent. Most areas are oval or long and narrow. Areas are generally 3 to 30 acres in size.

This map unit is about 50 percent Saprists, 40 percent Aquents, and 10 percent other soils. Some areas are Saprists, some are Aquents, and some consist of both kinds of soil. These soils were mapped together because their use and management are the same.

Saprists are too variable to have a typical profile. They consist of well decomposed, black organic material 16 to more than 60 inches thick over mineral deposits. The mineral material ranges from silty clay loam to gravelly loamy sand.

Aquents are also too variable to have a typical profile. They consist of mottled, bluish or grayish mineral soils. Texture ranges from silty clay loam to gravelly loamy sand.

Included with these soils in mapping are small, higher areas that are ponded for only brief periods. A few areas of these soils are subject to flooding by streams. Included areas make up about 10 percent of this map unit. At low elevations they are as large as 3 acres, but on the grit plateau they are as large as 10 acres.

The water table is at or above the surface throughout the year. Permeability ranges from moderately slow to moderately rapid. Reaction ranges from strongly acid to moderately alkaline in the Saprists and from strongly acid to neutral in the Aquents. Bedrock is at a depth of more than 5 feet.

Cattails, rushes, grasses, and other water-tolerant herbaceous plants make up the vegetation. No trees grow except where the water is very shallow.

Areas of this unit are mostly idle and often provide wetland wildlife habitat. Habitat can be improved by constructing islands and building nesting boxes.

Onsite investigation is needed to determine the feasibility for most uses. In most places these marshes are difficult to drain because the water level is controlled by the adjacent open water.

The capability classification is VIIIw.

ScA—Scio very fine sandy loam, 0 to 3 percent slopes. This nearly level soil formed in deposits of silt and very fine sand. This soil is deep and moderately well drained. The areas are usually oval or irregular in shape and are 3 to 10 acres in size.

Typically, the surface layer is friable, dark brown very fine sandy loam 12 inches thick. The subsoil is very

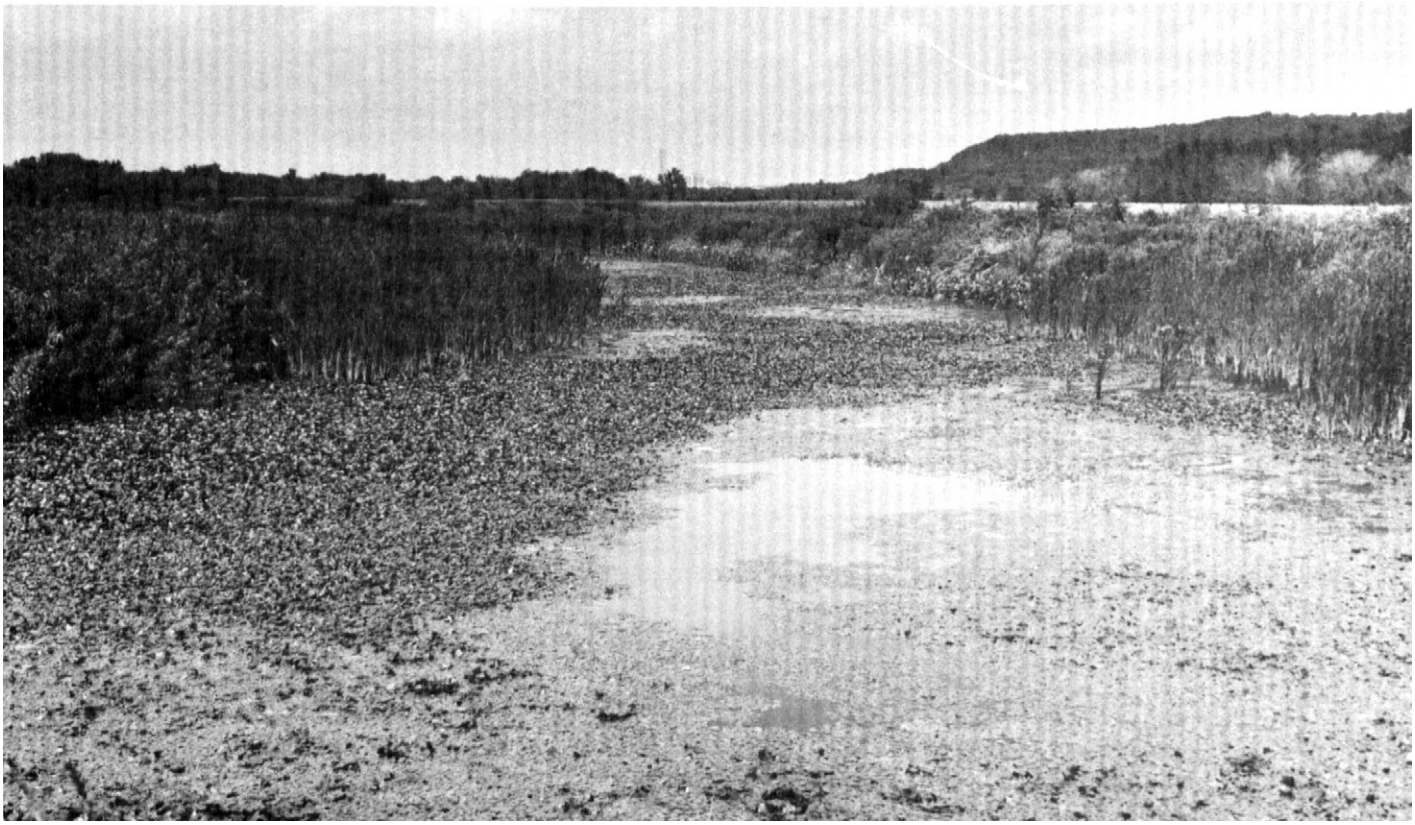


Figure 8.—This low, wet area of Saprists and Aquents, ponded, is on the flood plain close to the Hudson River.

friable, mottled, light olive brown very fine sandy loam to a depth of 41 inches. The substratum is loose, olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Unadilla, Raynham, Hudson, Rhinebeck, and Windsor soils. Unadilla soils are well drained and are on convex knolls. Raynham soils are somewhat poorly drained and poorly drained and are in depressions. Hudson and Rhinebeck soils have a high content of clay, and Windsor soils are sandy. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

In spring and during other wet periods, a seasonal high water table is 18 to 24 inches below the surface. In spring, rooting depth is restricted by the seasonal high water table. As the growing season progresses, the water table recedes and roots extend throughout the soil. Permeability is moderate in the subsoil and moderately rapid to rapid in the substratum. Available water capacity is high. Runoff is slow. In unlimed areas, reaction is very strongly acid to medium acid in the surface layer and the subsoil. Depth to bedrock is more than 5 feet.

Most of the acreage of this soil is used for corn, grain, and hay.

This soil is suited to corn, small grains, and hay. Seasonal wetness can delay tillage early in spring. Drainage allows earlier planting in spring and later harvesting in fall. Standard management practices—such as conservation tillage, cover crops, crop residue incorporated into the soil, tillage at the proper moisture content, and crop rotation—improve tilth and maintain organic matter content.

This soil is suited to pasture. When wet, this soil is subject to compaction by animals. Rotational grazing, annual mowing, and lime and fertilizer help to maintain pasture seedings.

Potential productivity for woodland is high. Soil wetness early in spring and during rainy periods can hinder use of machinery for planting. Trees that are tolerant of seasonal wetness are best for planting. Eastern white pine, Norway spruce, and white spruce are suitable for planting.

This soil has limitations for many urban uses. The seasonal high water table can cause wet basements and interferes with functioning of septic tank absorption fields. Rapid permeability in the substratum can cause

pollution of ground water by effluent from septic systems.

The capability classification is IIw.

ScB—Scio very fine sandy loam, 3 to 8 percent slopes. This gently sloping soil formed in deposits of silt and very fine sand. This soil is deep and moderately well drained. The areas are irregular in shape and generally are 3 to 15 acres in size.

Typically, the surface layer is friable, dark brown very fine sandy loam 12 inches thick. The subsoil is very friable, mottled, light olive brown very fine sandy loam to a depth of 41 inches. The substratum is loose, olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Unadilla, Raynham, Hudson, Rhinebeck, and Windsor soils. Unadilla soils are well drained and are on convex knolls. Raynham soils are somewhat poorly drained and poorly drained and are in depressions. Hudson and Rhinebeck soils are clayey, and Windsor soils are sandy. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

In spring and during other wet periods, a seasonal high water table is 18 to 24 inches below the surface. In spring, rooting depth is restricted by the high water table. As the growing season progresses, the water table recedes and roots extend throughout the soil. Permeability is moderate in the subsoil and moderately rapid to rapid in the substratum. Available water capacity is high. Runoff is slow to medium. In unlimed areas, reaction is very strongly acid to medium acid in the surface layer and the subsoil. Depth to bedrock is more than 5 feet.

Most of the acreage of this soil is used for corn and hay.

This soil is suited to corn, small grains, and hay. Seasonal wetness can delay tillage in spring. Erosion is a hazard, especially on long slopes. Drainage improves conditions for planting early in spring and harvesting late in fall. Standard management practices—such as conservation tillage, cover crops, cross-slope tillage, crop residue incorporated into the soil, tillage at proper moisture content, and crop rotation—improve tilth, maintain organic matter content, and reduce erosion.

This soil is suited to pasture. This soil is subject to compaction by animals during wet periods. Rotational grazing, annual mowing, and lime and fertilizer help to maintain pasture seedings.

Potential productivity for woodland is high. Soil wetness early in spring can hinder use of machinery for planting. Trees that are tolerant of seasonal wetness are suitable for planting. Eastern white pine, Norway spruce, and white spruce are suitable.

This soil has limitations for many urban uses. The seasonal high water table can cause wet basements and interferes with functioning of septic tank absorption fields. Rapid permeability in the substratum can cause pollution of ground water by effluent from septic systems. Mulching and seeding of newly landscaped areas help to prevent erosion on construction sites.

The capability classification is IIe.

SrA—Scriba silt loam, 0 to 3 percent slopes. This nearly level soil is on lower foot slopes and lowlying flats in the uplands. This soil is deep and somewhat poorly drained. The areas are oval and are 5 to 15 acres in size.

Typically, the surface layer is friable, very dark grayish brown silt loam, and the subsurface layer is friable, light brownish gray silt loam to a depth of 13 inches. The upper part of the subsoil is friable, mottled, brown silt loam. The rest of the subsoil is a very firm and brittle, mottled gravelly silt loam fragipan that extends to a depth of 50 inches. It is yellowish brown in the upper part and light olive brown in the lower part. The substratum is very firm, mottled, light olive brown gravelly silt loam to a depth of 60 inches.

Included with this soil in mapping are areas of Nassau, Manlius, Bernardston, Pittstown, Alden, and Raynham soils. Nassau soils are shallow, and Manlius soils are moderately deep. Bernardston soils are well drained, and Pittstown soils are moderately well drained; these soils are on convex knolls. Alden soils are very poorly drained and are in lower, concave areas. Raynham soils are somewhat poorly drained to poorly drained. Also included are areas of soils that are somewhat poorly drained and have bedrock at a depth of less than 60 inches and soils that have large stones on the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

A seasonal high water table is perched above the fragipan during wet periods. Depth to the top of the fragipan ranges from 12 to 21 inches. Rooting depth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is low to moderate. Runoff is slow. In unlimed areas, reaction is extremely acid to slightly acid above the fragipan and strongly acid to neutral in the fragipan. Depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture and hay. Some of the acreage is used for corn.

Seasonal wetness limits crop production. Drainage will increase yields. Standard management practices—such as conservation tillage, cover crops, crop residue incorporated into the soil, tillage at the proper moisture content, and crop rotation—improve tilth and maintain organic matter content.

This soil is suited to pasture. Because of the seasonal high water table, grazing should be restricted to the drier periods. Interceptor drains and open ditches improve drainage conditions for better pasture yields. Proper seeding rates and stocking the proper number of animals per acre maintain key plant species. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is moderately high. The seasonal high water table moderately hinders use of equipment and can increase seedling mortality. Eastern white pine, Norway spruce, and white spruce are suitable for planting.

This soil is not suitable for many urban uses because of the seasonal high water table and the slowly permeable fragipan.

The capability classification is IIIw.

SrB—Scriba silt loam, 3 to 8 percent slopes. This gently sloping soil is on lower parts of hillsides and along drainageways in the uplands. This soil is deep and somewhat poorly drained. The areas are oval and are generally 5 to 15 acres in size.

Typically, the surface layer is friable, very dark grayish brown silt loam, and the subsurface layer is friable, light brownish gray silt loam to a depth of 13 inches. The upper part of the subsoil is friable, mottled, brown silt loam. The rest of the subsoil is a very firm and brittle, mottled gravelly silt loam fragipan that extends to a depth of 50 inches. It is yellowish brown in the upper part and light olive brown in the lower part. The substratum is very firm, mottled, light olive brown gravelly silt loam to a depth of 60 inches.

Included with this soil in mapping are areas of Nassau, Manlius, Bernardston, Pittstown, Alden, and Raynham soils. Nassau soils are shallow, and Manlius soils are moderately deep. Bernardston soils are well drained, and Pittstown soils are moderately well drained; these soils are on convex knolls. Alden soils are very poorly drained and are in lower, concave areas. Raynham soils are somewhat poorly drained to poorly drained. Also included are areas of soils that are somewhat poorly drained and have bedrock at a depth of 30 to 60 inches and soils that are more sloping and have large stones on the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

A seasonal high water table is perched above the fragipan during wet periods. Depth to the top of fragipan ranges from 12 to 21 inches. Rooting depth is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is low to moderate. Runoff is slow to medium. In unlimed areas, reaction is extremely acid to slightly acid above the fragipan and strongly acid to neutral in the fragipan. Depth to bedrock is more than 60 inches.

Many areas of this soil are used for pasture or hay, and some are used for corn. Other areas are wooded or are idle.

The seasonal high water table limits crop production. Drainage will increase yields. On long slopes, erosion is a slight hazard. Practices such as contour tillage and stripcropping reduce erosion. Standard management practices—such as conservation tillage, cover crops, crop residue incorporated into the soil, tillage at the proper moisture content, and crop rotation—improve tilth and maintain organic matter content.

This soil is suited to pasture. Because of the seasonal high water table, grazing should be restricted to the drier periods. Interceptor drains and open ditches improve pasture growth. Proper seeding rates and stocking the proper number of animals per acre maintain key plant species. Rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is moderately high. The seasonal high water table moderately hinders use of equipment and can increase seedling mortality. Eastern white pine, Norway spruce, and white spruce are suitable for planting.

This soil is not suitable for most urban uses because of the seasonal high water table and the slowly permeable fragipan.

The capability classification is IIIw.

StB—Scriba very stony silt loam, 3 to 8 percent slopes. This gently sloping soil is on the lower parts of hillsides and along drainageways in the uplands. This soil is deep and somewhat poorly drained. Large stones are on the surface about 5 to 30 feet apart. The areas are oval and are generally 5 to 15 acres in size.

Typically, the surface layer is friable, very dark grayish brown silt loam, and the subsurface layer is friable, light brownish gray silt loam to a depth of 13 inches. The upper part of the subsoil is friable, mottled, brown silt loam. The rest of the subsoil is a very firm and brittle, mottled gravelly silt loam fragipan that extends to a depth of 50 inches. It is yellowish brown in the upper part and light olive brown in the lower part. The substratum is very firm, mottled, light olive brown gravelly silt loam to a depth of 60 inches.

Included with this soil in mapping are areas of Nassau, Manlius, Bernardston, Pittstown, Alden, and Raynham soils. Nassau soils are shallow, and Manlius soils are moderately deep. Bernardston soils are well drained, and Pittstown soils are moderately well drained; these soils are on convex knolls. Alden soils are very poorly drained and are in low concave areas. Raynham soils are somewhat poorly drained to poorly drained. Also included are areas of somewhat poorly drained soils that are 30 to 60 inches deep. Also included are areas of sloping soils and a few areas where this soil has no stones on the surface. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

A seasonal high water table is perched above the fragipan during wet periods. Depth to the top of the fragipan ranges from 12 to 21 inches. Rooting depth is somewhat restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is low to moderate. Runoff is slow to medium. In unlimed areas, reaction is extremely acid to slightly acid above the fragipan and strongly acid

to neutral in the fragipan. Depth to bedrock is more than 60 inches.

Most areas of this soil are wooded or idle. Some areas are used for pasture.

This soil is not suited to cultivated crops because of the seasonal high water table and the large number of stones on the surface. It is not suited to hay unless the large stones are removed.

This soil is generally not suitable for pasture. The large stones and seasonal wetness severely limit management practices such as annual mowing and reseeding. Restricted grazing during wet periods prevents soil compaction and trampling of desirable plant species.

Potential productivity for timber is moderately high. Use of equipment is moderately hindered by the stones on the surface and the seasonal high water table. Seedling mortality is increased by the high water table. Eastern white pine, Norway spruce, and white spruce are suitable for planting.

This soil is severely limited for most urban uses by the seasonal high water table and the slowly permeable fragipan.

The capability classification is VIIs.

SvB—Scriba-Pittstown association, very stony, gently sloping. The soils in this association are on toe slopes of the Taconic Mountains. The Scriba soils are along drainageways and in concave areas, and the Pittstown soils are in slightly higher, convex areas and are commonly more sloping than the Scriba soils. Slope ranges from 3 to 15 percent but is mainly 3 to 8 percent. The Scriba soils are deep and somewhat poorly drained, and the Pittstown soils are deep and moderately well drained. Stones and boulders are on the surface about 5 to 30 feet apart.

This association is 50 percent Scriba soils, 40 percent Pittstown soils, and 10 percent other soils. The areas of the association are oval or irregular in shape and are 10 to 50 acres in size.

Typically, the surface layer of the Scriba soils is very dark grayish brown silt loam 10 inches thick. The subsurface layer is light brownish gray silt loam 3 inches thick. The subsoil extends to a depth of 50 inches. The upper part of the subsoil is friable, mottled, brown silt loam; and the lower part is a very firm, mottled, yellowish brown and light olive brown gravelly silt loam fragipan. The substratum is mottled, light olive brown gravelly silt loam to a depth of 60 inches or more.

Typically, the Pittstown soils have a very friable, very dark grayish brown gravelly silt loam surface layer 9 inches thick. The subsoil is friable and extends to a depth of 24 inches. The upper part of the subsoil is yellowish brown gravelly silt loam, and the lower part is mottled, light olive brown gravelly silt loam. The substratum is a fragipan that extends to a depth of more than 60 inches. It is firm, mottled, olive gravelly silt loam.

Included with these soils in mapping are areas of poorly drained and very poorly drained soils, stratified gravelly soils, and shallow soils. Areas of included soils make up 10 percent of this map unit and are as large as 10 acres.

In Scriba and in Pittstown soils, a seasonal high water table is perched above the fragipan in spring and during other wet periods. Depth to the top of the fragipan ranges from 12 to 21 inches in the Scriba soils and 15 to 30 inches in the Pittstown soils. Rooting depth is restricted by the fragipan and by the seasonal high water table. Permeability is moderate above the fragipan and slow in the pan. Available water capacity is low to moderate in the Scriba soils and moderate in the Pittstown soils. Runoff is slow. Reaction ranges from extremely acid to slightly acid above the fragipan in the Scriba soils and from very strongly acid to medium acid throughout the Pittstown soils. Depth to bedrock is more than 60 inches.

Most areas of this unit are used for woodland or are idle.

This map unit is not suited to cultivation. Large stones on the surface, seasonal wetness, and a short growing season severely limit crop production. Erosion can be a problem on long slopes. Accessibility to many areas of this unit is poor.

Pasture management is difficult because of the large stones on the surface, seasonal wetness, and poor accessibility. Standard management practices such as annual mowing and reseeding are extremely difficult. Restricting grazing during wet periods and rotational grazing prevent soil compaction and trampling of pasture plants.

Potential productivity for timber is moderately high. Use of harvesting and planting equipment are moderately hindered by the large stones on the surface and the seasonal wetness. Water bars on logging roads reduce erosion during and after harvest. Eastern white pine, white spruce, Norway spruce, and European larch are suitable for planting.

These soils are generally not suitable for urban uses because of the seasonal high water table, the slowly permeable fragipan, and poor accessibility.

The capability classification is VIIs.

SwA—Shaker very fine sandy loam, sandy substratum, 0 to 4 percent slopes. This nearly level soil is in slight depressions and nearly flat areas. It formed in a thin mantle of loamy material over clayey sediment. This soil is deep and is somewhat poorly drained to poorly drained. The areas are rectangular and are generally 3 to 15 acres in size.

Typically, the surface layer is friable, very dark grayish brown very fine sandy loam 9 inches thick. The subsoil is friable and extends to a depth of 23 inches. It is mottled, grayish brown and dark brown fine sandy loam. The upper part of the substratum, to a depth of 48 inches, is

firm, brown silty clay. The lower part of the substratum is very friable, dark grayish brown loamy fine sand to a depth of 60 inches or more.

Included with this soil in mapping are many large areas of soils that are similar to this Shaker soil but that are somewhat poorly drained and areas of soils that have a surface layer of loamy fine sand or loamy sand. Also included are areas of soils in which the lower part of the substratum is loamy or clayey and areas of soils in which the depth to the clayey deposits ranges from less than 18 inches to more than 40 inches. Areas of Elmridge soils are included on a few small knolls. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

In spring and during other wet periods, the water table is at or near the surface. Rooting depth is limited by the seasonal high water table and the dense, clayey substratum. Permeability is moderately rapid in the surface layer, slow or very slow in the clayey substratum, and rapid in the underlying sandy deposits. Available water capacity is moderate to high. Surface runoff is slow. In unlimed areas, reaction ranges from strongly acid to slightly acid in the surface layer and subsoil and from medium acid to neutral in the clayey substratum.

Many areas of this soil are used for hay, corn, grains, and pasture for dairy farms.

This soil is suited to crops. Unless the soil is drained, seasonal wetness can delay planting in spring and can limit the choice of crop varieties. Standard management practices—such as conservation tillage, cover crops, crop residue incorporated into the soil, and crop rotation—improve tilth and maintain organic matter content.

This soil is suited to pasture. Proper seeding rates, rotational grazing, stocking the proper number of animals per acre, and annual mowing help to maintain production. Restricting grazing during wet periods helps to prevent soil compaction and trampling of pasture plants.

Potential productivity for woodland is low. Seasonal wetness severely hinders planting and harvesting and reduces seedling survival. Windthrow is a hazard because of the shallow rooting depth. Eastern white pine, white spruce, and northern white-cedar are suitable for planting.

This soil has limitations for urban use. The slowly or very slowly permeable, clayey substratum and the seasonal high water table severely limit many uses. Frost heaving is also a problem for some uses.

The capability classification is IIIw.

TeA—Teel silt loam, 0 to 3 percent slopes. This nearly level soil is on flood plains. It is moderately well drained to somewhat poorly drained and is deep. It is in long, narrow areas along secondary streams and in wider areas along the Hudson River. The areas range from 3 to 20 acres.

Typically, the surface layer is friable, dark grayish brown silt loam 12 inches thick. The subsoil extends to a depth of 40 inches. It is friable, dark grayish brown silt loam and is mottled in the lower part. The substratum is friable, mottled dark gray silt loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Hamlin and Limerick soils. Hamlin soils are well drained and are in higher, convex areas. Limerick soils are poorly drained and are in depressions. Also included are low areas of wet, very poorly drained soils, areas of soils that have a surface layer of fine sandy loam or loam, and a few areas of soils that have a surface layer of gravelly silt loam or gravelly very fine sandy loam. Areas of included soils make up about 15 percent of this map unit and are as large as 3 acres.

This soil is subject to flooding except along the Hudson River where control structures have been installed. Early in spring, the water table is at a depth of 6 to 24 inches and fluctuates with the water level in the adjacent streams. Rooting depth is somewhat restricted by the seasonal high water table but increases as the water table recedes during the growing season. Permeability is moderate. Available water capacity is high. Runoff is slow. In unlimed areas, reaction is strongly acid to neutral in the surface layer and strongly acid to mildly alkaline in the subsoil. Depth to bedrock is more than 5 feet.

Most of the acreage of this soil is used for cash crops and corn and hay for dairy farms.

This soil is well suited to most crops grown in the area. The major limitations are flooding early in spring and the seasonal wetness. In some places the soil is subject to stream gouging and deposition by the flooding. The high water table in spring can delay planting. This soil responds well to drainage, but suitable outlets are often difficult to locate. Conservation tillage, cover crops, return of crop residue to the soil, and sod crops maintain tilth and a high content of organic matter.

This soil is suited to pasture. Restricted grazing when the soil is wet and proper stocking rates prevent soil compaction and loss of pasture seedings. Proper seeding rates to maintain key plant species and annual mowing are needed.

Potential productivity for timber is high. The use of equipment is hindered only by seasonal wetness. Seedling mortality is generally low. Norway spruce, European larch, and eastern white pine are suitable for planting.

This soil is not suitable for urban uses because it is subject to flooding and has a seasonal high water table.

The capability classification is IIw.

Ud—Udorthents, loamy. This map unit consists of nearly level areas that have been excavated or are filled with loamy soil material. The areas are commonly near urban centers and major highways. Slope is mostly 0 to

5 percent. The soils are deep and well drained or moderately well drained. The areas are irregular in shape and generally are 6 to 50 acres in size.

These soils are too variable to have a typical profile, and the normal sequence of horizons has been disrupted or destroyed. Texture ranges from sandy loam to silty clay loam with varying amounts of gravel.

Included with these soils in mapping are areas filled with rock fragments excavated from the quarries; some of these areas support little vegetation. Also included are a few areas of sandy or clayey deposits and some areas of parking lots and buildings. In some areas, small depressions are ponded during wet periods. Included areas make up about 10 percent of this map unit and are as large as 3 acres.

These soils are highly variable in composition. Therefore, soil properties such as permeability, available water capacity, and reaction vary from one area to another.

The suitability of these soils for rural and urban uses varies from poor to good. Onsite investigation is needed to evaluate each site for any proposed use.

No capability classification is assigned.

Ue—Udorthents, sandy. This map unit consists of nearly level areas of material that was dredged from the Hudson River. In places, the material is piled into small knolls and knobs. Slope is mostly 0 to 5 percent. The soils are deep, sandy, and moderately well drained to excessively drained. The areas are elongated parallel to the river (north-south) and generally are 50 to 400 acres in size.

These soils are too variable to have a typical profile. Texture is mostly loamy sand or sand with varying amounts of gravel. Gravelly layers are close to the surface in most places. Material is deposited occasionally by new dredging; consequently, subsurface layers show weak stratification.

Included with these soils in mapping are small areas of Hamlin, Teel, and Limerick soils. Hamlin soils are well drained, Teel soils are moderately well drained and somewhat poorly drained, and Limerick soils are poorly drained. Areas of included soils make up about 10 percent of this map unit and are as large as 3 acres.

These soils are flooded rarely to occasionally. Bedrock is generally at a depth of more than 10 feet. Permeability, available water capacity, runoff, organic matter content, and reaction vary from site to site.

This unit is so variable that onsite investigation is needed to evaluate any use. Periodic flooding, coarse fragments, and general infertility of these soils make them unsuitable for crops, pasture, woodland, or urban use.

This unit is suitable for wildlife habitat. It will support bushes and scrub trees.

These soils are generally a good source of sand and gravel.

No capability classification is assigned.

UnA—Unadilla silt loam, 0 to 3 percent slopes. This nearly level soil formed in delta deposits that have a high content of silt and very fine sand. This soil is deep and well drained. The areas are irregular in shape or oval and are generally 3 to 20 acres in size.

Typically, the surface layer is friable, brown silt loam 7 inches thick. The subsoil is friable and extends to a depth of 33 inches. The upper part of the subsoil is yellowish brown and dark yellowish brown silt loam, and the lower part is dark yellowish brown and yellowish brown very fine sandy loam. The substratum is friable, brown very fine sandy loam to a depth of 62 inches or more.

Included with this soil in mapping are small areas of Scio, Raynham, and Windsor soils. Scio soils are moderately well drained, and Raynham soils are somewhat poorly drained to poorly drained; these soils are in low areas and depressions. Windsor soils are sandy. Also included are small areas of soils that have gravelly layers at or near the surface; these areas are near flood plains. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is moderate. Available water capacity is high. Surface runoff is slow. In unlimed areas, reaction ranges from very strongly acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 5 feet.

This soil is used mostly for corn, small grains, and hay.

This soil is well suited to a wide variety of crops. Cover crops, crop rotation, conservation tillage, and crop residue returned to the soil improve available water capacity, increase organic matter content, and promote good tilth.

This soil is well suited to pasture. Standard management practices such as rotational grazing, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is high. Removing brush and planting carefully improve seedling survival. Eastern white pine, red pine, Norway spruce, and European larch are suitable for planting.

This soil has only slight limitations for most urban uses. Frost action and low soil strength can be minor problems for some uses.

The capability classification is I.

UnB—Unadilla silt loam, 3 to 8 percent slopes. This gently sloping soil formed in deposits that have a high content of silt and very fine sand. This soil is deep and well drained. The areas are oval and generally are 3 to 20 acres in size.

Typically, the surface layer is friable, brown silt loam 7 inches thick. The subsoil is friable and extends to a depth of 33 inches. The upper part of the subsoil is yellowish brown and dark yellowish brown silt loam, and the lower part is dark yellowish brown and yellowish

brown very fine sandy loam. The substratum is friable, brown very fine sandy loam to a depth of 62 inches or more.

Included with this soil in mapping are small areas of Scio, Raynham, and Windsor soils. Scio soils are moderately well drained, and Raynham soils are somewhat poorly drained to poorly drained; these soils are on foot slopes. Windsor soils are sandy. Small gravelly spots are included near flood plains. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is moderate. Available water capacity is high. Surface runoff is medium. In unlimed areas, reaction ranges from very strongly acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 5 feet.

This soil is used mainly for corn, grain, and hay. A small percentage is used for pasture.

This soil is well suited to cultivated crops and hay. Erosion is a hazard, particularly on long slopes. Cross-slope tillage, cover crops, crop rotation, conservation tillage, and crop residue returned to the soil reduce erosion and improve organic matter content and tilth.

This soil is well suited to pasture. On longer slopes, erosion is a hazard, especially if the pasture is overgrazed. Proper seeding rates, rotational grazing, annual mowing, stocking the proper number of animals per acre, and lime and fertilizer help to maintain seedings and reduce erosion.

Potential productivity for timber is high. Removing brush and planting carefully early in spring improve seedling survival. Erosion along logging roads is a hazard on long slopes. Eastern white pine, red pine, and Norway spruce are suitable for planting.

This soil is suited to most urban uses. Erosion is a slight hazard, so grading operations should be done carefully and the area reseeded as soon as possible. Frost action and low soil strength can be problems for some uses.

The capability classification is IIe.

UnC—Unadilla silt loam, 8 to 15 percent slopes. This sloping soil formed in deposits that have a high content of silt and very fine sand. This soil is deep and well drained. The areas are elongated and generally are 3 to 20 acres in size.

Typically, the surface layer is friable, brown silt loam 7 inches thick. The subsoil is friable and extends to a depth of 33 inches. The upper part of the subsoil is yellowish brown and dark yellowish brown silt loam, and the lower part is dark yellowish brown and yellowish brown very fine sandy loam. The substratum is friable, brown very fine sandy loam to a depth of 62 inches or more.

Included with this soil in mapping are small areas of Scio and Windsor soils. Scio soils are moderately well drained. Windsor soils are sandy. Also included are small areas of soils that have gravelly layers near the surface. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is moderate. Available water capacity is high. Surface runoff is medium to rapid. In unlimed areas, reaction ranges from very strongly acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 5 feet.

This soil is used mainly for corn, grain, and hay. Some areas are used for pasture.

This soil is suited to cultivated crops and hay. Erosion is a major limitation, particularly on long slopes. Cross-slope tillage, cover crops, crop rotation, conservation tillage, and crop residue returned to the soil reduce erosion, improve organic matter content, and promote good tilth.

This soil is suited to pasture. On long slopes, erosion is a hazard, especially if overgrazing damages the sod or the pasture seedings. Proper seeding rates to maintain key plant species, rotational grazing, stocking the proper number of animals per acre, annual mowing, and lime and fertilizer are needed.

Potential productivity for timber is high. Erosion is a hazard, particularly on long slopes. Erosion can be reduced by constructing access roads and logging trails on the contour. Seedlings can be planted by machine. Removing brush and planting carefully reduce plant competition and improve seedling survival. Eastern white pine and red pine are suitable for planting.

Slope is the principal limitation for urban uses. Erosion, frost action, and low soil strength also limit some uses.

The capability classification is IIIe.

Ur—Urban land. This map unit consists of heavily built-up residential and commercial areas, 90 percent of which is covered with streets, buildings, and parking lots. The areas are mostly nearly level to sloping. The areas are generally 3 to 20 acres in size.

Included are small areas of Udorthents, loamy. Some areas of this unit were filled before development. In a few places, the fill was placed on flood plains or marshes.

Onsite investigation is needed to determine the suitability and limitations of any small open areas or abandoned areas for any use.

No capability classification is assigned.

WnA—Windsor loamy sand, 0 to 3 percent slopes. This nearly level soil is adjacent to small hills and on deltas and terraces. It is deep and excessively drained. The areas are oval and generally are 3 to 20 acres in size.

Typically, the surface layer is very friable, dark brown loamy sand 8 inches thick. The subsoil extends to a depth of 21 inches. The upper part of the subsoil is very friable, yellowish brown loamy sand; and the lower part is loose, dark yellowish brown sand. The substratum is

loose, light olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of soils that have a subsoil that is reddish brown and is finer textured than the subsoil of this Windsor soil. Also included are areas of gravelly soils and areas of Riverhead and Haven soils. Riverhead and Haven soils consist of loamy deposits over very gravelly material. Small areas of somewhat poorly drained soils are included in low spots and along drainageways. Also included are a few areas of soils that are underlain by clay at a depth of more than 5 feet. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is rapid or very rapid. Available water capacity is very low to moderate. Runoff is very slow. Reaction is very strongly acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

This soil is used mainly for corn, hay, and some pasture. Some areas are used for vegetable crops.

This soil is only moderately suited to most crops grown in the area unless it is irrigated. Droughtiness is the main limitation for crop production. Sprinkler irrigation systems can greatly increase crop yields. Cover crops, crop rotation, conservation tillage, and crop residue returned to the soil improve tilth, increase organic matter content, and improve the available water capacity of the soil.

This soil has only fair suitability for pasture because of droughtiness. Stocking the proper number of animals per acre and rotational grazing help to maintain pasture seedings. Lime and fertilizer are needed for good yields.

Potential productivity for timber is low. Droughtiness causes severe seedling mortality. Removing brush and planting early in spring increase survival of seedlings. Eastern white pine and red pine are suitable for planting.

This soil has limitations for many urban uses. Pollution of ground water by effluent from septic systems is possible because water moves rapidly or very rapidly through the soil. Wind erosion can be a problem where vegetation is removed during grading and construction. Excavations cave in. Lawns are difficult to establish because of the droughtiness. This soil is a probable source of sand.

The capability classification is IIIs.

WnB—Windsor loamy sand, 3 to 8 percent slopes. This gently sloping soil is on small hills and terraces. This soil is deep and excessively drained. The areas are oval to nearly square and generally are 3 to 10 acres in size.

Typically, the surface layer is very friable, dark brown loamy sand 8 inches thick. The subsoil extends to a depth of 21 inches. The upper part of the subsoil is very friable, yellowish brown loamy sand; and the lower part is loose, dark yellowish brown sand. The substratum is loose, light olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of soils that have a subsoil that is reddish brown and is finer textured than the subsoil of this Windsor soil. Also included are small areas of Riverhead and Haven soils, which consist of loamy deposits over gravelly material. Spots of Hoosic soils, which are gravelly, are included on some knolls. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is rapid or very rapid. Available water capacity is very low to moderate. Runoff is slow. In unlimed areas, reaction is very strongly acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

This soil is used mainly for corn, hay, and some pasture.

This soil is moderately suited to the crops grown in this area. Droughtiness is the main limitation. Crop yields can be increased considerably by irrigation. Because it is gently sloping, this soil is more difficult to irrigate than the nearly level Windsor soil. Also, erosion can be a hazard if the irrigation system is not properly designed and water is not properly managed. Contour plowing, conservation tillage, crop rotation, cover crops, and crop residue returned to the soil reduce erosion and increase available water capacity of the soil.

This soil is suited to pasture, but droughtiness limits yields. Overgrazing can increase the hazard of erosion. Stocking the proper number of animals per acre and rotational grazing help to maintain seedings. Lime and fertilizer are needed for good yields.

Potential productivity for timber is low. Droughtiness causes severe seedling mortality. Removing brush and planting early in spring improve seedling survival. Eastern white pine and red pine are suitable for planting.

This soil has limitations for urban uses. Effluent from septic systems can pollute ground water because water moves rapidly or very rapidly through the substratum. Erosion is a severe hazard in areas cleared of vegetation during construction. Excavations can cave in. Recreational uses such as playgrounds and athletic fields are more limited by slope on this soil than on the nearly level Windsor soils.

The capability classification is IIIs.

WnC—Windsor loamy sand, 8 to 15 percent slopes. This sloping soil is on hills and terraces. It is deep and excessively drained. The areas are oval or nearly square and generally are 3 to 10 acres in size.

Typically, the surface layer is very friable, dark brown loamy sand 8 inches thick. The subsoil extends to a depth of 21 inches. The upper part of the subsoil is very friable, yellowish brown loamy sand; and the lower part is loose, dark yellowish brown sand. The substratum is loose, light olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of soils that have a subsoil that is reddish brown and is finer textured than the subsoil of this Windsor soil. Also included are small areas of Riverhead and Hoosic soils. Riverhead soils consist of loamy material over gravelly deposits. Hoosic soils are gravelly and are on knolls. Areas of included soils make up about 20 percent of this map unit and are as large as 3 acres.

Permeability is rapid or very rapid. Available water capacity is very low to moderate. Runoff is medium. In unlimed areas, reaction is very strongly acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

This soil is used mainly for hay and pasture. Some areas are used for corn, and the rest is idle or wooded.

This soil can be used for most crops grown in the area. These soils are much more droughty than less sloping Windsor soils, so crop yields are lower. Irrigation systems are difficult to design and operate because of slope and are not generally used. Erosion is a severe hazard, especially where slopes are long and where the soil is irrigated. Cross-slope tillage, cover crops, crop rotation, conservation tillage, and crop residue returned to the soil reduce erosion, improve organic matter content, maintain tilth, and conserve soil moisture.

Pasture yields are low on this soil because of droughtiness. Overgrazing can lead to loss of pasture seedings and results in erosion. Proper seeding rates to maintain key plant species, stocking the proper number of animals per acre, and rotational grazing are needed.

Potential productivity for timber is low. Droughtiness causes severe seedling mortality. Eastern white pine and red pine are suitable for planting.

This soil has limitations for urban uses. Erosion is a severe hazard on construction sites where vegetation has been removed. Cutbanks cave in. The rapid or very rapid permeability allows effluent from septic systems to pollute ground water if the systems are not designed properly. Slope also limits some uses.

The capability classification is VIs.

WnE—Windsor loamy sand, 25 to 35 percent slopes. This steep soil is on hillsides and sides of dissecting gullies on sand plains. This soil is deep and excessively drained. The areas are elongated and narrow and generally are 3 to 10 acres in size.

Typically, the surface layer is very friable, dark brown loamy sand 8 inches thick. The subsoil extends to a depth of 21 inches. The upper part of the subsoil is very friable, yellowish brown loamy sand; and the lower part is loose, dark yellowish brown sand. The substratum is loose, light olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of soils that have gravelly layers at the surface or in the subsoil and soils that have a silt loam surface layer. In some areas this soil is severely eroded, and in some areas the soil is moderately steep. Areas of included soils make up about 25 percent of this map unit and are as large as 3 acres.

Permeability is rapid or very rapid. Available water capacity is low to moderate. Runoff is rapid. Reaction is very strongly acid to medium acid in the surface layer and subsoil. Depth to bedrock is more than 6 feet.

Most areas of this soil are idle or are wooded.

This map unit is not suitable for cultivation. The main limitations are steep slope and droughtiness. In addition, erosion is a very serious hazard if the plant cover is removed.

This soil is poorly suited to pasture. Grazing is limited to early spring and late fall because of droughtiness in summer. Restricting grazing during dry periods and rotational grazing help to maintain pasture seedings and reduce erosion.

This soil is poorly suited to woodland. Erosion is a serious hazard but can be controlled by constructing logging roads on the contour and using water bars to control runoff. Droughtiness causes severe seedling mortality. Eastern white pine and red pine are suitable for planting.

This soil is poorly suited for urban uses. Steep slope and a severe erosion hazard are the main limitations. Very rapid and rapid permeability can allow pollution of ground water by effluent from septic systems if the systems are not properly designed or constructed. Droughtiness makes establishing vegetation difficult.

The capability classification is VIIs.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Rensselaer County are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

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

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 6 percent.

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

About 49,691 acres, or nearly 12 percent, of Rensselaer County meets the soil requirements for prime farmland. Areas of prime farmland are scattered throughout the county, but many areas are in the major valleys and on the nearly level to undulating plains in the western and central parts of the county. The main crops grown on prime farmland soils are corn, small grains, hay, vegetables, and nursery stock.

A recent trend in land use in some parts of the county, particularly in the western part near Troy and the Hudson River, has been the conversion of some prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are wet, more erodible, droughty, or difficult to cultivate and less productive than prime farmland.

The following map units, or soils, make up prime farmland in Rensselaer County. On some soils included in the list, appropriate measures have been applied to overcome the seasonal high water table; the soils that need drainage to qualify as prime farmland are noted. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed soil map units." This list does not constitute a recommendation for a particular land use.

AlB Albrights silt loam, 3 to 8 percent slopes
BeB Bernardson gravelly silt loam, 3 to 8 percent slopes
CbA Castile gravelly silt loam, 0 to 5 percent slopes
ChA Chenango very gravelly loam, 0 to 3 percent slopes
ChB Chenango very gravelly loam, 3 to 8 percent slopes
CkB Chenango gravelly loam, fan, 3 to 8 percent slopes
ElB Elmridge very fine sandy loam, 3 to 8 percent slopes
FrA Fredon silt loam, 0 to 4 percent slopes (where drained)
HaA Hamlin silt loam, 0 to 3 percent slopes
HbA Haven silt loam, 0 to 3 percent slopes
HbB Haven silt loam, 3 to 8 percent slopes
ObA Occum Variant-Barbour Variant complex, 0 to 3 percent slopes
PtB Pittstown gravelly silt loam, 3 to 8 percent slopes

RaA Raynham silt loam, 0 to 5 percent slopes (where drained)
RkA Riverhead fine sandy loam, 0 to 3 percent slopes
RkB Riverhead fine sandy loam, 3 to 8 percent slopes
ScA Scio very fine sandy loam, 0 to 3 percent slopes
SwA Shaker very fine sandy loam, sandy substratum, 0 to 4 percent slopes (where drained)
TeA Teel silt loam, 0 to 3 percent slopes
UnA Unadilla silt loam, 0 to 3 percent slopes

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

John F. Nigro, district conservationist, Soil Conservation Service; Thomas F. Kilcer, extension agent, Cooperative Extension Service; and George W. Kyer, Agricultural Stabilization and Conservation Service, helped to prepare this section. Dr. Shaw Reid, Cornell University Agronomy Department, assisted in the review of this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

More than 109,000 acres in Rensselaer County was in farms in 1974 *(16)*. Of this, 65,000 acres was in cropland, including pasture. Woodland and other uses occupied 44,000 acres.

The potential for increased crop production is good in certain parts of the county. A large acreage of potentially good cropland is currently pastured, wooded, or idle *(13)*. In addition to the reserve productive capacity represented by this land, crop yields could be increased by extending the latest technology to all cropland, along with appropriate conservation practices. This soil survey can facilitate the use of new technology and the application of conservation practices.

The acreage in crops and pasture has decreased rapidly in the last few decades as more and more land has been converted to urban and recreational purposes. Using the soil survey to help make land use decisions that will influence the future of farming is discussed in the sections "Use and Management of the Soils" and "Detailed Soil Map Units."

Principles of Management

General principles of soil management related to crop production are discussed in the following paragraphs.

Soil erosion is a major hazard on about half of the cropland in Rensselaer County *(13)*. The hazard of erosion is related to slope, erodibility of the soil, amount and intensity of rain, and plant cover.

Loss of soil through erosion is damaging for several reasons, including loss of nutrients and water, formation of gullies, deterioration of tilth, detrimental sedimentation downslope, and pollution of streams and reservoirs. Soil productivity is reduced when the surface layer is lost and increasing amounts of material from the subsoil are incorporated into the plow layer, especially if the soil has a fine textured or moderately fine textured subsoil, as in Rhinebeck and Hudson soils, or has a compact subsoil

that restricts roots, as in Bernardston and Pittstown soils. Erosion also reduces productivity on soils that tend to become droughty through the loss of organic matter, such as Hoosic and Chenango soils. Nassau, Manlius, and other soils that are shallow or moderately deep over bedrock are permanently damaged by erosion. Soils having a high silt content, like Unadilla and Scio soils, are very susceptible to erosion.

Control of water erosion is generally needed where slope is greater than 3 percent. Hudson, Unadilla, and Scio soils, all of which are high in silt and do not contain coarse fragments, are the most susceptible to erosion.

Erosion control measures provide protective cover, reduce runoff, and increase water infiltration. Many tillage and conservation practices aid in erosion control. Conservation tillage, no-till, cover crops, crop residue left on the surface, and a cropping system that has a high proportion of sod grasses are effective in reducing erosion on soils that have short, irregular slopes, such as Hoosic, Riverhead, and Nassau soils. Contour tillage, stripcropping, terraces, and diversions are suitable on soils that have smooth, long, uniform slopes, such as the sloping Pittstown and Bernardston soils.

Soil blowing is a hazard on Windsor and other sandy soils and on cleared and drained areas of the organic Carlisle and Palms soils, particularly if the surface is dry. Windbreaks, regulation of the water table, and irrigation are effective in reducing the risk of soil blowing.

The effectiveness of a particular combination of conservation practices differs on different soils. Moreover, different combinations can be equally effective on the same soil. The local representative of the Soil Conservation Service can assist in planning an effective combination of practices to reduce the risk of erosion.

Soil drainage is needed on about one-third of the soils that are suitable for crops in this county. Some soils are so wet that the production of common crops is generally not possible without extensive drainage. Examples are the poorly drained and very poorly drained Alden, Carlisle, Madalin, Palms, Raynham, Shaker, Fredon, and Limerick soils.

Seasonal wetness interferes with early planting, growth, and harvesting of most crops on somewhat poorly drained soils such as Scriba, Fredon, Raynham, and Rhinebeck soils. Crops on these soils respond well to improved drainage, and yields are often as high as on naturally well drained soils.

Some well drained and moderately well drained soils, such as Unadilla, Bernardston, Riverhead, and Pittstown soils, contain small wet areas. Random subsurface drains in these areas allow more uniform management of fields.

The wetness of some sloping soils, such as Pittstown and Rhinebeck soils, can be reduced by installing interceptor drains to divert surface runoff and subsurface seepage coming from higher lying areas.

The design of a drainage system varies with the kind of soil. Subsurface drainage is slow in Scriba, Madalin, Rhinebeck, and other poorly drained and very poorly drained soils. These soils may need a combination of surface and subsurface drainage. Rapidly permeable Fredon and Castile soils, on the other hand, respond well to subsurface drainage alone if adequate outlets are available. Also, drains must be more closely spaced in slowly permeable soils than in more permeable soils.

Surface drainage can include open ditches, grassed waterways, land smoothing, and bedding. Most subsurface drains are tile. Establishing drainage outlets is difficult and expensive in many places because of the low position of the wet soils.

Information on drainage systems and their cost is available from the office of the Rensselaer County Soil and Water Conservation District.

Surface stones, boulders, and rock outcrops severely limit use for crops and pasture in many areas, particularly in the eastern and central parts of the county. The stones and rock outcrops interfere with use of equipment. Some of these soils, such as the very stony Buckland and Bernardston soils, are generally used only for permanent pasture, but fertilizing, reseeding, and mowing are still difficult. Pasture management is even more difficult on the very stony Scriba soils because of the prolonged seasonal wetness.

Removing the larger stones and boulders may be feasible on soils that have few other limiting properties. In areas having rock outcrops, overcoming limitations is usually not feasible. Some areas of Macomber and Taconic soils, for instance, have extensive rock outcrops.

Available water capacity is important in growing crops. Some soils in Rensselaer County tend to be droughty. Sandy and gravelly soils, soils that have a restricting layer such as a fragipan, and soils that are shallow or moderately deep over bedrock tend to have fairly low capacity for storing water. The gravelly Hoosic soils, the sandy Windsor soils, Scriba soils, which have a fragipan, and the shallow Nassau soils have low or very low available water capacity. Maintaining or increasing the organic matter content of the surface layer increases the available water capacity of droughty soils. Growing green manure crops and plowing in crop residue and manure increase the content of organic matter and improve structure of the surface layer.

Soil tilth is an important factor in the emergence of seedlings, the infiltration of water, and the ease of cultivation. Soils with good tilth usually have granular structure and are porous.

Tilth is affected by the kind and amount of tillage. Excessive tillage tends to reduce organic matter content and breaks down soil structure. Some soils that are deep, well drained or excessively drained, and coarse textured or moderately coarse texture, Riverhead and Hoosic soils are examples, can be tilled with little or no

worry. Wetter and finer textured soils, such as Hudson, Rhinebeck, and Madalin soils, must be tilled at the proper moisture content to prevent damage to the natural structure. Plowing or cultivating when these soils are wet causes puddling and results in formation of a hard surface crust and clods when the soil is dry.

Cultivating at the proper moisture content; growing sod grasses, green manure crops, and cover crops; and returning crop residue and adding manure help to keep the soil granular and porous.

Soil fertility is important to crops. All soils in Rensselaer County need lime or fertilizer for optimum crop production. The amount needed depends on the natural content of lime and plant nutrients, on the needs of the particular crop, and on the level of yield desired.

Organic matter has a significant effect on fertility. Average organic matter content in the surface layer of the soils of this county is about 3.5 percent. Poorly drained and very poorly drained soils have somewhat more organic matter.

Nitrogen is contained in the organic matter, but much of this nitrogen cannot be used by plants until the organic matter has been decomposed by microorganisms. Nitrogen fertilizer is needed to supplement the nitrogen derived from organic matter. Building up the supply of organic matter by growing green manure crops and sod grasses and returning crop residue to the soil increases the nitrogen content.

Applying nitrogen at the right time is important for maximum utilization by plants. Nitrogen can be lost through leaching in rapidly permeable soils, such as Hoosic soils, or by denitrification in wetter and less permeable soils, such as Rhinebeck soils. The best results are obtained by applying small amounts of nitrogen at intervals, for instance at planting and then as a side dressing while the crop is growing.

The soils in this county are generally low in natural phosphorus. Coarse textured soils, such as Hoosic and Windsor soils, tend to be very low in phosphorus. Addition of commercial phosphate fertilizer is essential for good crop growth.

Most of the soils are low to medium in available potassium. Soils that have a clayey subsoil, such as Hudson, Rhinebeck, and Madalin soils, are somewhat higher in potassium. Even these soils, however, require additional potassium for optimum yields of most crops.

Lime is also needed in most of the soils in the survey area to raise the pH to an acceptable level for optimum yields of most crops.

Additions of lime and fertilizer should be based on soil tests. Assistance in obtaining soil tests and recommendations is available from the local cooperative extension agent. New research findings and fertilizer recommendations are available in current editions of "Cornell Recommends for Field Crops" and "Vegetable Production Recommendations." In the absence of soil tests, these guides, along with this soil survey, can be used to determine needs for lime and fertilizer.

Special crops, including vegetable and orchard crops, are important in Rensselaer County. Orchard crops are grown on various kinds of soil, mostly in the vicinity of the Hudson River where climate is favorable. Apples are the principal commercial orchard crop. There is also a small acreage of pears and peaches.

The most recent information and suggestions for growing orchard and vegetable crops and the estimated potential yields of these crops can be obtained from the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

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

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

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

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does

not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 7.

Woodland Management and Productivity

Robert E. Smith, Jr., state staff forester, Soil Conservation Service, helped to prepare this section.

In 1968, 243,800 acres of Rensselaer County, approximately 57 percent, was commercial forest *(14).* Commercial forest is land that is producing or is capable of producing industrial wood crops and is not withheld from this use. Nineteen percent of the commercial forest is owned by farmers, and 78 percent by other private owners. Only 3 percent of the forest is publicly owned.

Rensselaer County has forest of several major types. The following list gives the acreage of each type and the percentage of the volume of growing stock (live trees of commercial species) associated with each:

Forest type	Acreage	Percent
Maple-beech-birch	71,300	26
Elm-ash-red maple	56,700	17
White and red pine	51,700	31
Oak	36,000	14
Other softwoods	10,500	6
Aspen-birch	9,400	2
Oak-pine	8,200	4

Stands of sawtimber (live trees having a minimum diameter of 9.0 inches for softwoods and 11.0 inches for hardwoods) make up 39 percent of the commercial forest. Stands of poletimber (live trees at least 5.0 inches in diameter) make up 18 percent, and stands of seedlings and saplings make up 38 percent. About 5 percent of the commercial forest is classified as nonstocked (less than 16.7 percent tree density).

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil; *d*, restricted

root depth; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, d, s, and r.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in 50 years. The site index applies to fully stocked, evenaged, unmanaged stands and is listed for species that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. Other commonly grown species are also listed.

Woodland productivity can be related to site index in terms of volume growth. Table 9 shows the expected mean annual growth of selected kinds of trees for various site indices.

Trees to plant are those that are suited to the soil and to commerical wood production. Species listed in this column are not necessarily recommended for all conditions, but they are the best suited for planting on the soil. Landowners and forest managers can minimize planting failures by matching tree species with suitable soils. Professional foresters can recommend the best selection from the list of species and provide a plan for planting.

Recreation

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines (fig. 9). The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

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

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding

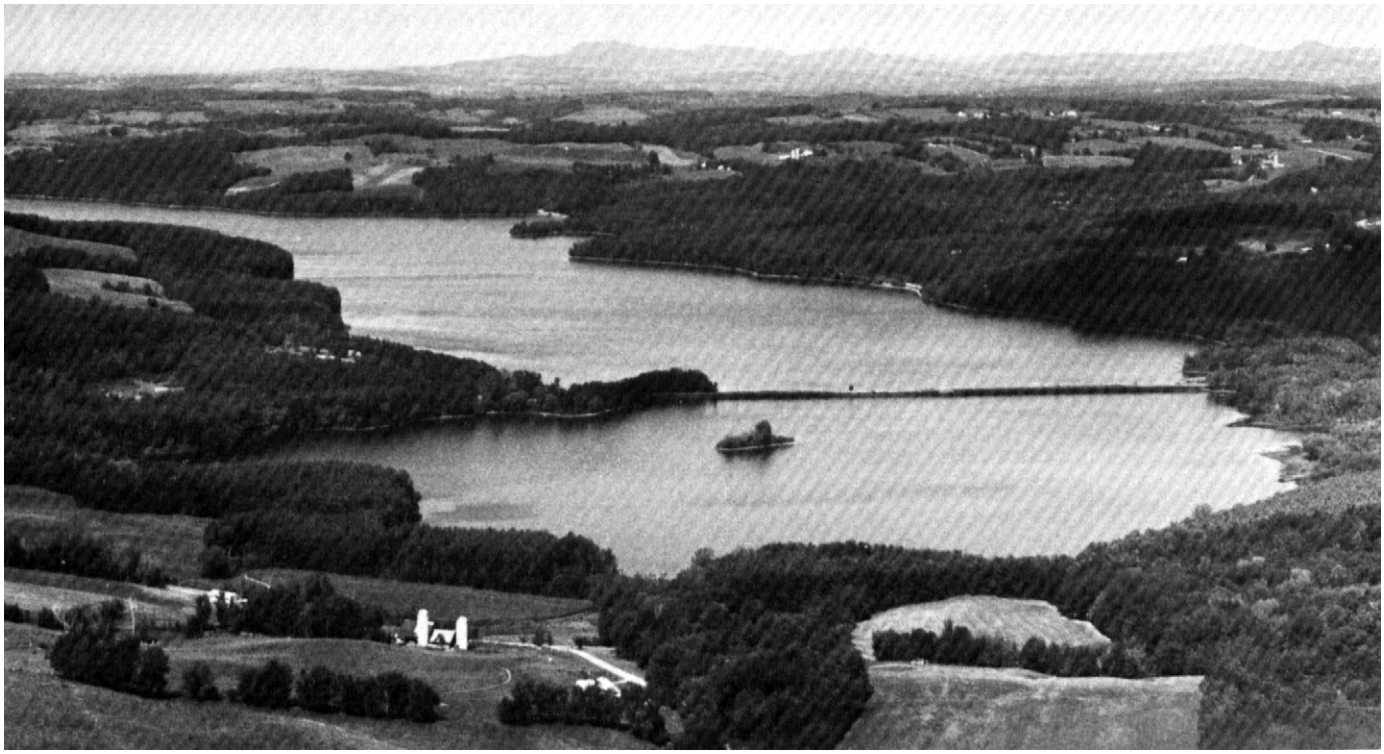


Figure 9.—A popular fishing area, Tomhannock Reservoir is in the rolling landscape of the Bernardston-Pittstown-Nassau general soil map unit.

during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

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

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Robert E. Myers, wildlife biologist, Soil Conservation Service, helped to prepare this section.

Wildlife is an important resource in Rensselaer County. The diverse land-use patterns throughout the central and western parts of the county—agricultural land, forest, shrubby areas, and idle grassland—provide habitat for cottontail rabbits, whitetailed deer, ruffed grouse, and gray squirrels. Scattered populations of ringnecked pheasants live in the Hudson Valley along the western edge of the county. The heavily forested mountainous region in the eastern part of the county provides habitat for snowshoe hare, grouse, squirrel, deer, and wild turkey. Songbirds are found throughout the county, but the population is more diverse in the areas of mixed land use.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

Grain and seed crops are domestic grains and seed producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, timothy, bromegrass, clover, birdsfoot trefoil, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and asters.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, beech, poplar, birch, cherry, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit producing shrubs that are suitable for planting on soils rated *good* are autumn-olive and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, arrowhead, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

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

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, snowshoe hare, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development,

Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

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

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

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinkswell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil),

shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

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

Sanitary Facilities

Table 13 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 13 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a fragipan, and flooding affect absorption of the effluent. Large stones and bedrock or a fragipan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 13 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a fragipan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and fragipans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 13 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a fragipan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary

landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a fragipan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt and claysized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 14, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

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

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Figure 10.—This recreation pond is in a depression surrounded by Hoosic gravelly sandy loam, rolling, which is used for crops.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

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

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a

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

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

Aquifer-fed excavated ponds are pits or dugouts that extend to a groundwater aquifer or to a depth below a permanent water table (fig. 10). Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a fragipan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Edward A. Fernau, senior soil engineer, New York State Department of Transportation, Soil Mechanics Bureau, helped to prepare this section.

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grainsize distribution, plasticity, and compaction characteristics. These results are reported in table 19.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

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

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture *(12,15).* These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1).*

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grainsize distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grainsize distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1a, A-1b, A-24, A-25, A-26, A-27, A-75, or A-76. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 19.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dryweight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074

millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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

Physical and Chemical Properties

Table 17 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from airdry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that

can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 17, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 18 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Some soils in table 18 are assigned to two hydrologic soil groups for one of two reasons: (1) Some soils have a seasonal high water table but can be drained. In this instance the first letter applies to the drained condition of the soil and the second letter to the undrained condition. (2) In some soils that are less than 20 inches deep to bedrock, the first letter applies to areas where the bedrock is cracked and pervious and the second letter to areas where the bedrock is impervious or where exposed bedrock makes up more than 25 percent of the surface of the soils.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 18 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 18.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particlesize distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 19 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the New York State Department of Transportation, Soil Mechanics Bureau.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classificationM 145 (AASHTO); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO); Liquid limit—T 89 (AASHTO); Plasticity index—T 90 (AASHTO); Moisture density, Method CT 99 (AASHTO); Shrinkage—D 427 (ASTM).

Engineering Properties of Geologic Deposits

This section discusses the engineering characteristics of the various unconsolidated geologic deposits in Rensselaer County and their relation to soils. This discussion should be helpful to planners, designers, engineers, contractors, and others associated with construction projects involving earthy materials. It should be noted that some terms have somewhat different meanings in engineering than in soil science.

The engineering properties of a geologic deposit are influenced to a great extent by how it was deposited, for this determines that texture of the material and its internal structure. Other influences are the position in the landscape and the level of the water table. In Rensselaer County the geologic deposits can be divided into deep till, shallow-to-rock deposits, stratified coarse-grained deposits, stratified fine-grained deposits, and organic deposits.

Deep Till Deposits

Deep till is an unstratified, highly variable mixture of all particle sizes from boulders to clay. This material was scoured and transported from nearby sources by glacial ice and deposited as ground moraines. Bedrock is usually more than five feet beneath the surface, but in some small areas rock may be closer to the surface or may even crop out. The individual rock and mineral fragments in the soil generally reflect the kinds of bedrock in the immediate area.

Albrights, Alden, Bernardston, Brayton, Buckland, Pittstown, and Scriba soils formed in mixed deep till. These soils are the most dense and compact of the unconsolidated deposits in the county. Most of the till has been compacted by overriding ice. Deep till soils range from nearly level to very steep, with most being gently sloping or sloping. Many landscapes are such that cutting and filling is needed for most construction.

These soils provide stable, relatively imcompressible foundations for engineering works. Fill material from

these deposits, if properly compacted, usually provides stable embankments. Steep cutslopes often are subject to sloughing and erosion.

Shallow-To-Rock Deposits

Shallow till is an unstratified mixture of glacially transported material deposited as a thin veneer over bedrock. The till is usually less than five feet thick, and rock outcrops are common. The landforms and topography are generally controlled by the bedrock.

Glover soils formed in mixed shallow till over graywacke sandstone. Macomber and Taconic soils formed in mixed shallow till over phyllite bedrock, and Manlius and Nassau soils formed over shale. Bedrock of this county is described in the section "Physiography and Geology." Soils that formed in shallow till generally have adequate foundation strength for light structures, but the primary engineering concerns may relate to the underlying bedrock and ground water conditions. The topography may be such that cutting and filling would be necessary for extensive works. In general, the shale and phyllite are softer and more deeply weathered than the graywacke sandstone. Fill material is limited in quantity because of the shallowness.

Stratified Coarse-Grained Deposits

This material is dominated by gravel and sand sorted by glacial meltwater into layered or stratified deposits. They are on outwash plains and terraces, kames, the coarser portions of deltas, alluvial fans, and flood plains. The strata within these deposits may be well sorted or poorly sorted and range from cobbles to silt. The deposits are loose and porous. Coarse textured soils on flood plains are also included.

Castile, Chenango, Fredon, Riverhead, and Hoosic soils formed in gravelly and sandy deposits of outwash plains and kames. Chenango soils are also on alluvial fans. Haven and Windsor soils are on deltas, and Scio and Unadilla soils are on old terraces. Barbour variant and Occum variant soils formed in alluvium over sand and gravel.

Coarse-grained material generally has relatively high strength. Because they are loose and porous, most of these deposits are not highly erodible but will settle when vibrated. The Barbour and Occum variant soils are susceptible to flooding.

This material has many uses as construction material. Depending on gradation, soundness, and plasticity, the material can be used as fill for parking areas, freedraining backfill for structures and pipes, and sand and gravel for general use.

Stratified Fine-Grained Deposits

Fine-grained sediment was transported by glacial meltwater and deposited in glacial lakes and ponds where water movement was minimal. Also included are more recent slackwater deposit on flood plains. The deposits commonly consist of distinct layers, or laminations, usually of silt and clay. Although the material is mostly silt, there is generally enough clay to make it plastic and sticky.

Hudson, Madalin, and Rhinebeck soils formed in deep lakelaid silt and clay. Elmridge and Shaker soils formed in shallow sandy deposits over silt and clay. Raynham soils formed in deep sediment on deltas. Hamlin, Teel, and Limerick soils are on alluvial flood plains.

Because of the fine texture and high moisture content, this material has relatively low strength. It is usually highly compressible and may settle over long periods. The soils with a high silt content are less compressible but are highly erodible and susceptible to frost action. The soils on flood plains are subject to flooding.

The fine-grained material is difficult to use for engineering works, especially where wet. Soils that formed in these finer sediments generally have low strength and tend to settle.

Organic Deposits

Organic deposits are for the most part accumulations of plant remains. In places they include small amounts of mineral material. These deposits occur in very poorly drained depressions that are covered with water part of the year.

Beseman, Carlisle, Loxley, and Palms soils formed in organic material. Area of Saprists and Aquents, ponded, are inundated. The organic soils are entirely unsuitable for foundations because they are wet and highly compressible. Generally the organic material should be removed and replaced with suitable backfill. Filling over organic deposits causes long-term settling.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(15)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soilforming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquepts (*Hapl*, meaning minimal horizonation, plus *aquept*, the suborder of the Inceptisol that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Aeric Haplaquepts (*Aeric* indicating that the soils are better aerated than typical).

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, three dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual *(12)*. Many of the technical terms used in the descriptions are defined in Soil Taxonomy *(15)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Albrights Series

The Albrights series consists of deep, moderately well drained soils on glaciated uplands. These soils formed in firm, reddish glacial till that was derived from shale, slate, and sandstone. These soils have a dense fragipan in the subsoil. Slope ranges from 3 to 40 percent.

Typical pedon of Albrights silt loam, 3 to 8 percent slopes; in a hayfield, 100 feet north of Rabie Road, 0.5 mile east of Millers Corners Road; town of Sand Lake:

Ap—0 to 9 inches; dark brown (7.5YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; many roots; 10

percent coarse fragments; strongly acid; abrupt smooth boundary.

B21t—9 to 14 inches; brown (7.5YR 5/4) shaly silt loam; moderate fine subangular blocky structure; friable; common roots; few patchy clay films on ped faces and in pores; 20 percent coarse fragments; strongly acid; clear wavy boundary.

B22t—14 to 19 inches; reddish brown (5YR 5/3) shaly silty clay loam; common medium distinct gray (7.5YR 6/1) and brown (7.5YR 4/4) mottles; strong coarse prismatic structure parting to moderate coarse subangular blocky; firm; few roots; continuous light reddish brown (5YR 6/3) clay films on ped faces; 20 percent coarse fragments; strongly acid; clear wavy boundary.

Bx—19 to 36 inches; reddish brown (5YR 4/3) shaly silt loam; very coarse prismatic structure parting to moderate medium platy; very firm, brittle; prism faces are pinkish gray (7.5YR 6/2) outlined with reddish brown (5YR 5/6); few patchy clay films in root channels; 25 percent coarse fragments; strongly acid; clear wavy boundary.

B3—36 to 40 inches; weak red (2.5YR 4/2) shaly silt loam; strong medium subangular blocky structure; very firm; 15 percent coarse fragments; neutral.

The solum ranges from 40 to 65 inches in thickness. Depth to bedrock is more than 5 feet. Depth to the fragipan ranges from 18 to 30 inches. Coarse fragments, mainly shale and gravel, make up 5 to 15 percent of the surface layer and 10 to 30 percent of the subsoil and substratum. Reaction is strongly acid or very strongly acid in the upper part of the solum in unlimed areas, and is medium acid to neutral in the lower part of the solum.

The Ap horizon has hue of 7.5YR, value of 3 or 4, and chroma of 2 or 3. Unplowed areas have an A1 horizon 1 to 3 inches thick. It has hue of 7.5YR, value of 2 or 3, and chroma of 1 or 2. Underlying the A1 horizon is an A2 horizon having hue of 7.5YR, value of 4 or 5, and chroma of 2 to 4. Texture of the A horizon is loam or silt loam.

The B2 horizon has hue of 5YR to 7.5YR, value of 4 or 5, and chroma of 3 to 6. Texture ranges from silt loam to clay loam, and is shaly or gravelly in places.

The Bx and B3 horizons have hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 2 to 6. Texture ranges from silt loam to clay loam and is shaly or gravelly in places.

Some pedons have a C horizon that is similar to the B3 horizon in color, texture, and reaction.

Alden Series

The Alden series consists of deep, very poorly drained soils in depressions on the hilly uplands. These soils formed in glacial till that was derived mainly from shale, slate, and sandstone. Slope ranges from 0 to 3 percent.

Typical pedon of Alden silt loam, 0 to 3 percent slopes; in a brushy field, 200 feet south of Beechwood Road, 1/8 mile east of intersection of county Route 102, and Beechwood Road; town of Hoosick:

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam; moderate medium granular structure; friable; many roots; common fine prominent dark red root stains; slightly acid; abrupt smooth boundary.

B21g—7 to 12 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine faint light olive brown (2.5Y 5/4) mottles; weak fine subangular blocky structure; friable; few roots; common fine pores; neutral; diffuse wavy boundary.

B22g—12 to 30 inches; gray (5Y 5/1) silty clay loam; many fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; firm; few roots; common fine pores; neutral; diffuse wavy boundary.

B3—30 to 40 inches; olive (5Y 4/3) silt loam; common fine faint light olive brown (2.5Y 5/4) mottles; weak medium subangular blocky structure; firm, sticky; few fine pores; 5 percent coarse fragments; neutral; diffuse wavy boundary.

IIC—40 to 60 inches; olive (5Y 4/3) gravelly silt loam; massive; very firm; 20 percent coarse fragments of phyllite; mildly alkaline.

The solum ranges from 24 to 40 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 15 percent of the volume of the solum and 5 to 35 percent of the substratum. Reaction is strongly acid to neutral in the solum and slightly acid to moderately alkaline in the substratum. The lower part of the substratum is calcareous in some pedons.

The A horizon is neutral or has hue of 10YR; value is 2 or 3, and chroma is 0 or 1. Texture ranges from very fine sandy loam to silt loam.

The B horizon is neutral or has hue of 2.5Y or 5Y; value is 4 to 6, and chroma is 0 to 3. Texture ranges from very fine sandy loam to silty clay loam. Structure is subangular blocky or platy, or the soil is massive. Consistence is friable or firm.

The C horizon has hue of 5YR to 5Y, value of 4 or 5, and chroma of 1 to 3. Texture ranges from very fine sandy loam to silt loam and is gravelly in places. This horizon is massive or has platy structure. Consistence is firm or very firm.

Aquents

Aquents are deep, very poorly drained mineral soils that are bluish or gray in color. These soils are ponded with shallow water throughout the year. Aquents formed in glaciolacustrine sediment, glaciofluval sediment, glacial till, and alluvial deposits. Slope ranges from 0 to 1 percent.

Because of the variability of Aquents, a typical pedon is not provided.

Aquents are more than 5 feet deep to bedrock. Coarse fragments make up 0 to 50 percent, by volume, throughout. These soils are slightly acid to strongly acid in the surface layer and strongly acid to neutral in the substratum.

The A horizon has hue of 7.5YR to 10YR or is neutral; value is 3 or 4, and chroma is 0 to 3. Texture of the fine earth fraction ranges from mucky silt loam to loam. The A horizon is 8 to 10 inches thick.

The C horizon has hue of 10YR, 5BG, or 5G; value of 4 to 6; and chroma of 1 or 2. Mottles are common or many and distinct. Texture of the fine earth fraction ranges from silty clay loam to loamy sand.

Barbour Variant

The Barbour variant consists of deep, well drained soils on flood plains. These soils formed in recent alluvium. Slope ranges from 0 to 3 percent.

Typical pedon of Barbour variant silt loam in an area of Occum Variant-Barbour Variant complex, 0 to 3 percent slopes; in a field, 880 feet east of New York Route 22, 0.5 mile north of its intersection with Goodell Road; town of Petersburg:

Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B2—19 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.

B22—16 to 25 inches; yellowish brown (10YR 5/4) loam; weak fine subangular blocky structure; friable; few fine roots; medium acid; clear wavy boundary.

B23—25 to 31 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; medium acid; abrupt wavy boundary.

B3—31 to 35 inches; brown (10YR 5/3) silt loam; common fine distinct gray (5Y 6/1) mottles and common fine faint dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; friable; medium acid; clear smooth boundary.

IIC—35 to 60 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; 45 percent coarse fragments; medium acid.

The solum ranges from 20 to 38 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 10 percent of the solum and 0 to 60 percent of the substratum. Reaction is strongly acid or medium acid throughout.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. Texture is silt loam, fine sandy loam, or loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. Texture is loam, silt loam, or fine sandy loam. This horizon has weak or moderate subangular blocky structure, or it has weak or moderate platy structure that parts to subangular blocky.

The C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 3 or 4. Texture of the fine earth fraction is loamy sand or sand. Structure is thick platy, or the horizon is massive or single grained. Consistence is friable, very friable, or loose.

Bernardston Series

The Bernardston series consists of deep, well drained soils on glaciated uplands. These soils formed in glacial till derived from shale, slate, and sandstone. These soils have a dense fragipan in the substratum. Slope ranges from 1 to 40 percent.

Typical pedon of Bernardston gravelly silt loam, 15 to 25 percent slopes; in town landfill off Chamberlain Road, 500 feet north of equipment shed, 75 feet west of hedgerow; town of Sand Lake:

Ap—0 to 8 inches; brown (10YR 4/3) gravelly silt loam; moderate medium granular structure; friable; many fine and medium roots; 15 percent coarse fragments; strongly acid; abrupt wavy boundary.

B21—8 to 18 inches; yellowish brown (10YR 5/4) gravelly silt loam; weak medium subangular blocky structure; friable; common fine roots; 15 percent coarse fragments; very strongly acid; clear wavy boundary.

B22—18 to 22 inches; brown (10YR 5/3), dark yellowish brown (10YR 4/4), and light yellowish brown (10YR 6/4) gravelly loam; moderate medium subangular blocky structure; friable; common fine roots; 20 percent coarse fragments; strongly acid; clear wavy boundary.

B3—22 to 30 inches; dark brown (10YR 4/3) gravelly loam; weak thick platy structure parting to weak fine and medium subangular blocky; friable; few fine roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—30 to 60 inches; light olive brown (2.5Y 5/4) gravelly loam; few fine distinct grayish brown (10YR 5/2), yellowish brown (10YR 5/6), and pale brown (10YR 6/3) mottles; moderate medium platy structure; very firm, brittle; 25 percent coarse fragments; strongly acid.

The solum ranges from 15 to 30 inches in thickness. Depth to bedrock is more than 5 feet. Depth to the fragipan ranges from 15 to 30 inches. Coarse fragments, mainly shale, slate, and sandstone, make up 10 to 35 percent of the volume of the soil. Reaction is very strongly acid to medium acid.

The Ap horizon has hue of 7.5YR to 10YR, value of 3 or 4, and chroma of 3. Texture is gravelly loam, gravelly silt loam, or silt loam.

The B2 horizon has hue of 10YR to 2.5Y, value of 4 or 5, and chroma of 2 to 6. Texture is loam or silt loam or their gravelly or channery analogs. Structure is weak or moderate, fine or medium, granular or subangular blocky. Consistence is friable or very friable.

The B3 horizon has hue of 10YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. Texture is loam or silt loam or their gravelly or channery analogs. Structure is weak or moderate, platy or subangular blocky.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. Texture is loam or silt loam or their gravelly or channery analogs. This horizon has platy structure or is massive. Consistence is firm or very firm.

Beseman Series

The Beseman series consists of very poorly drained organic soils in depressions and bogs on alluvial plains and upland till plains of the grit plateau. These soils formed in decomposed organic material 16 to 50 inches thick over mineral soil. Slope ranges from 0 to 1 percent.

Typical pedon of Beseman muck in an area of Loxley and Beseman mucks, 0 to 1 percent slopes; in a sparsely wooded area, 200 feet south of Babock Lake Road, 1 mile north of New York Route 2; town of Grafton:

Oa1—0 to 8 inches; muck (sapric material), dark reddish brown (5YR 3/2) broken face, very dark gray (5YR 3/1) rubbed; about 30 percent fiber, about 10 percent rubbed; massive; friable; 10 percent mineral material; few roots; very strongly acid; abrupt smooth boundary.

Oa2—8 to 30 inches; muck (sapric material), dark reddish brown (5YR 2/2) broken face, black (5YR 2/1) rubbed; about 10 percent fiber, about 5 percent rubbed; massive; friable; 10 percent mineral material; few roots; very strongly acid; clear smooth boundary.

Oa3—30 to 38 inches; muck (sapric material), black (5YR 2/1) broken face and rubbed; 20 percent fiber, less than 5 percent rubbed; massive; friable, slightly sticky, slightly plastic; 20 percent mineral material; very strongly acid; abrupt smooth boundary.

IICg—38 to 60 inches; gray (10YR 5/1) gravelly loam (stony glacial till); massive; firm; 20 percent coarse fragments; medium acid.

Thickness of the organic material and depth to the mineral substratum range from 16 to 51 inches. Depth to bedrock is more than 5 feet. Reaction is extremely acid or very strongly acid in the organic layers and extremely acid to neutral in the mineral substratum.

The surface layer has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. Some pedons contain hemic material.

The organic subsurface layer has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. The material is dominantly sapric. Content of fiber ranges from 0 to 45 percent and is 0 to 15 percent after rubbing. This layer generally is 10 to 30 percent mineral material.

The mineral substratum is typically gray loamy glacial till. It is 0 to 25 percent coarse fragments.

Brayton Series

The Brayton series consists of deep, somewhat poorly drained or poorly drained soils on till plains of the grit plateau. These soils formed in glacial till that was derived mainly from sandstone. These soils have a dense fragipan in the subsoil. Slope ranges from 0 to 3 percent.

Typical pedon of Brayton gravelly silt loam in an area of Brayton very stony silt loam, nearly level; in a wooded area, 100 feet east of Long Pond Road, 3/4 mile northeast of the outlet of Second Pond; town of Grafton:

O2—1 inch to 0; decomposed leaf litter.

Ap1—0 to 7 inches; very dark grayish brown (10YR 3/2) gravelly silt loam; weak medium granular structure; friable; many roots; 15 percent coarse fragments; very strongly acid; clear smooth boundary.

Ap2—7 to 11 inches; dark brown (10YR 3/3) gravelly silt loam; moderate medium granular structure; friable; common roots; 15 percent coarse fragments; strongly acid; clear smooth boundary.

B21—11 to 16 inches; grayish brown (2.5Y 5/2) gravelly loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.

B22—16 to 19 inches; light olive brown (2.5Y 5/4) loam; many medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few roots; 20 percent coarse fragments; strongly acid; clear wavy boundary.

Bx1—19 to 30 inches; olive brown (2.5Y 4/4) gravelly loam; strong thick platy structure within coarse and very coarse prisms; very firm; few roots on prism faces; light brownish gray (2.5Y 6/2) coats on prisms having streaks outlined by reddish brown (5YR 4/4) borders; manganese stains; 20 percent coarse fragments; medium acid; clear wavy boundary.

Bx2—30 to 60 inches; yellowish brown (10YR 5/4) gravelly loam; strong thick platy structure within coarse and very coarse prisms; very firm; streaks of light olive gray (5Y 6/2) with brown to dark brown

(7.5YR 4/4) borders on prisms; 25 percent coarse fragments; slightly acid.

The solum is 40 inches or more thick. Depth to bedrock is more than 5 feet. Depth to the fragipan ranges from 13 to 24 inches. Coarse fragments, mainly sandstone, make up 10 to 35 percent of the volume of the soil above the fragipan and 10 to 45 percent of the fragipan. Reaction above the fragipan is very strongly acid to slightly acid, and in the fragipan it is medium acid to neutral.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 4, and chroma of 2 or 3. Texture is loam, silt loam, or sandy loam and is gravelly in places.

The B2 horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4. Texture is loam or sandy loam and is gravelly in places.

The Bx horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. Texture is loam or sandy loam and is gravelly or very gravelly in places.

Buckland Series

The Buckland series consists of deep, well drained or moderately well drained soils on the grit plateau. These soils formed in glacial till that was derived mainly from sandstone. These soils have a very firm fragipan in the lower part of the subsoil. Slope ranges from 3 to 50 percent.

Typical pedon of Buckland loam in an area of Buckland very stony loam, sloping; in a wooded area, 75 feet east of Woods Road, 50 feet north of access road to Davitt Pond, 1/4 mile west of parking lot; town of Poestenskill:

O1—2 inches to 0; dark reddish brown (5YR 2/2) partially decomposed leaf mat.

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine and medium roots; 10 percent coarse fragments; very strongly acid; abrupt wavy boundary.

B2—2 to 18 inches; dark yellowish brown (10YR 4/4) gravelly loam; weak medium subangular blocky structure parting to weak fine granular; very friable; many fine and medium roots; 25 percent coarse fragments; very strongly acid; clear wavy boundary.

A'2—18 to 22 inches; brown (10YR 5/3) gravelly loam; few fine faint light brownish gray (10YR 6/2) and few fine distinct brown (7.5YR 4/4) mottles; weak medium platy structure; firm; common fine and medium roots; common fine pores; 20 percent coarse fragments; very strongly acid; abrupt wavy boundary.

B'x—22 to 60 inches; brown (10YR 4/3) gravelly loam; few fine yellowish brown (10YR 5/4) mottles; moderate very coarse prismatic structure parting to weak medium subangular blocky; very firm, brittle; grayish brown (10YR 5/2) ped faces; 3/8 to 1/2 inch streaks between prisms, streak are light gray (10YR 7/1) with strong brown (7.5YR 5/6) borders; prisms range from 6 inches to 20 inches in width; discontinuous clay films in pores; 20 percent coarse fragments; black manganese stains; medium acid.

The solum is 40 inches or more thick. Depth to bedrock is more than 60 inches. Depth to the top of the fragipan ranges from 18 to 36 inches. Texture throughout is silt loam, loam, or sandy loam and is gravelly in places. Coarse fragments, mainly of sandstone, make up 5 to 25 percent of the volume of the soil above the fragipan and 10 to 35 percent of the fragipan. Reaction is strongly acid to very strongly acid above the pan and strongly acid to medium acid in the fragipan.

The Ap or A1 horizon has hue of 10YR, value of 2 to 4, and chroma of 2.

The B2 horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 6.

The A'2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 to 3.

The B'x horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3.

Buckland soils in this county are taxadjuncts to the Buckland series because they lack a spodic horizon; are very strongly acid above the fragipan and strongly acid in the pan; have hue of 5YR and chroma of 6 in the B2 horizon and hue of 10YR in the B'x horizon; and have very coarse prismatic structure in the B'x horizon. These differences, however, do not greatly affect the use or management of these soils.

Carlisle Series

The Carlisle series consists of deep, very poorly drained organic soils in depressions on the glaciated uplands, lake plains, and outwash plains. These soils formed in well decomposed woody organic material that accumulated in bogs. Slope ranges from 0 to 1 percent.

Typical pedon of Carlisle muck, 0 to 1 percent slopes; in a wooded area, approximately 200 feet south of old trolley line, 4,000 feet southeast of East Schodack Road, 300 feet east of Rice Road; town of Schodack:

Oa1—0 to 10 inches; muck (sapric material), black (10YR 2/1) broken face and pressed; about 10 percent fibers, less than 2 percent rubbed; weak coarse granular structure; slightly sticky, slightly plastic; 30 percent silt; common roots; neutral; abrupt smooth boundary.

Oa2—10 to 35 inches; muck (sapric material), black (10YR 2/1) broken face, rubbed, or pressed; 30 percent fibers, 5 percent rubbed; massive; slightly sticky, slightly plastic; 10 percent silt; slightly acid; clear smooth boundary.

Oa3—35 to 62 inches; muck (sapric material), very dark grayish brown (10YR 3/2) broken face, rubbed, and pressed; 20 percent fibers, 5 percent rubbed; massive; slightly sticky, slightly plastic; slightly acid; clear smooth boundary.
Lco—62 to 70 inches; coprogenous earth, dark olive gray (5Y 3/2) broken face, rubbed, and pressed; 5 percent fibers; thin platy structure; slightly plastic, slightly sticky; neutral; abrupt smooth boundary.
IIC1—70 to 88 inches; dark gray (10YR 4/1) gravelly loam; massive; slightly plastic, slightly sticky; neutral; abrupt smooth boundary.
IIC2—88 to 100 inches; dark gray (N 4/0) gravelly loam to sandy loam; massive; sticky and plastic; neutral.

Depth to bedrock is more than 60 inches. Thickness of the organic layers is more than 51 inches. Reaction in the organic layers ranges from very strongly acid to neutral. Some pedons have up to 30 percent woody fragments throughout the profile.

The subsurface and bottom tiers range from black (5YR 2/1) to dark brown (10YR 3/3). Sapric material is dominant but some pedons have layers of hemic material or coprogeneous earth less than 10 inches thick.

The IIC horizon ranges from silty clay loam to gravelly sandy loam.

Castile Series

The Castile series consists of deep, moderately well drained soils on outwash plains and terraces. These soils formed in glacial outwash. Slope ranges from 0 to 5 percent.

Typical pedon of Castile gravelly silt loam, 0 to 5 percent slopes; 300 feet west of Julienne Drive, 1/4 mile west of Richwood Road at Julienne Drive; town of Schodack:

Ap—0 to 10 inches; dark brown (10YR 3/3) gravelly silt loam; weak medium subangular blocky structure parting to weak fine granular; friable; many fine, common medium, and few large roots; 20 percent coarse fragments; very strongly acid; abrupt smooth boundary.
B21—10 to 19 inches; yellowish brown (10YR 5/4) very gravelly loam; weak medium subangular blocky structure; friable; many fine roots; 40 percent coarse fragments; very strongly acid; clear wavy boundary.
B22—19 to 27 inches; brown (10YR 5/3) very gravelly sandy loam; common medium distinct grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; very friable; few fine roots; 40 percent coarse fragments; strongly acid; clear wavy boundary.
B3—27 to 32 inches; grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) very gravelly sandy loam; common fine faint brown (10YR 4/3) mottles and few fine and medium distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; few fine roots in upper part; 40 percent coarse fragments; few thin brown (7.5YR 5/2) horizontal bands; strongly acid; clear wavy boundary.
IIC—32 to 60 inches; very dark grayish brown (10YR 3/2) very gravelly sand; single grain; loose; 36 percent coarse fragments; slightly acid.

The solum ranges from 24 to 40 inches in thickness. Depth to bedrock is more than 60 inches. Coarse fragments, mainly gravel, make up 15 to 30 percent of the volume of the A horizon, 20 to 50 percent of the B horizon, and 35 to 60 percent of the C horizon. In unlimed areas, reaction is very strongly acid to medium acid in the surface layer and subsoil and strongly acid to neutral in the substratum.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 4, and chroma of 2 or 3. The fine earth fraction is loam or silt loam.

The B2 horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. Texture of the fine earth fraction ranges from sandy loam to silt loam.

The B3 horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. Texture of the fine earth fraction ranges from sandy loam to silt loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4. The horizon ranges from loam to stratified sand and gravel.

Chenango Series

The Chenango series consists of deep, well drained or somewhat excessively drained soils on glacial outwash plains and terraces. These soils formed in glacial outwash that was derived mainly from slate, shale, and quartzite. Slope ranges from 0 to 8 percent.

Typical pedon of Chenango very gravelly loam, 3 to 8 percent slopes; in the side of a gravel pit, north side of Sherman Road across from golf course; town of Schodack:

Ap—0 to 7 inches; brown (10YR 4/3) very gravelly loam; moderate fine granular structure; very friable; many fine and medium roots; 50 percent coarse fragments; very strongly acid; abrupt smooth boundary.
B21—7 to 13 inches; dark yellowish brown (10YR 4/4) very gravelly loam; weak medium subangular blocky structure; friable; many fine and medium roots; 50 percent coarse fragments; strongly acid; gradual wavy boundary.
B22—13 to 43 inches; dark brown (10YR 4/3) and dark yellowish brown (10YR 4/4) very gravelly loam; weak fine and medium subangular blocky structure; friable; common fine roots; 60 percent coarse fragments; strongly acid; gradual wavy boundary.

IIC1—43 to 60 inches; dark brown (10YR 4/3) very gravelly loamy sand; massive; very friable; common fine roots; 65 percent coarse fragments; strongly acid; clear wavy boundary.
IIC2—60 to 78 inches; very dark grayish brown (10YR 3/2) very gravelly loamy sand; single grain; loose; few fine roots; 60 percent coarse fragments; strongly acid.

The solum ranges from 24 to 43 inches in thickness. Depth to bedrock is more than 60 inches. Coarse fragments make up 15 to 55 percent of the A horizon, 20 to 60 percent of the B horizon, and 30 to 70 percent of the substratum. In unlimed areas, reaction is very strongly acid or strongly acid to a depth of 30 inches. In the C horizon reaction ranges from strongly acid to mildly alkaline.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. Texture of the fine earth fraction is sandy loam, loam, or silt loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. The B21 horizon is silt loam, loam, or fine sandy loam in the fine earth fraction. The B22 horizon is loam or fine sandy loam in the fine earth fraction.

The IIC horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Texture of the fine earth fraction ranges from loamy fine sand to coarse sand.

Elmridge Series

The Elmridge series consists of deep, moderately well drained soils on lake plains. These soils formed in lakelaid deposits in which 18 to 40 inches of moderately coarse textured material overlies fine textured material. Slope ranges from 3 to 8 percent.

Typical pedon of Elmridge very fine sandy loam, 3 to 8 percent slopes; 100 feet north of county Route 2, 3,000 feet north of the Columbia County line, 1.5 miles east of Muitzeskill Corners; town of Schodack:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak fine granular structure; friable; many roots; neutral; abrupt smooth boundary.
B21—9 to 18 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common roots; common fine and medium pores; strongly acid; clear wavy boundary.
B22—18 to 24 inches; dark yellowish brown (10YR 4/4) fine sandy loam; common medium distinct brown (7.5YR 4/4) and grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; few roots; common medium pores; strongly acid; clear wavy boundary.
B23—24 to 36 inches; dark yellowish brown (10YR 4/4) fine sandy loam; common medium distinct dark grayish brown (2.5Y 4/2) mottles; massive; friable; few roots; few medium pores; medium acid; abrupt smooth boundary.
IIC—36 to 60 inches; mixed olive brown (2.5Y 4/4) and brown (7.5YR 4/4) varved silty clay, thin layers of very fine sand and clay between varves; massive; firm, sticky, plastic; medium acid.

The solum thickness ranges from 18 to 40 inches, which is the depth to the underlying clayey material. Depth to bedrock is more than 60 inches. Coarse fragments make up 0 to 3 percent of the soil. Clay content ranges from 35 to 60 percent in the IIC horizon. In unlimed areas, reaction is strongly acid or medium acid throughout.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is very fine sandy loam, fine sandy loam, or sandy loam.

The B horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. Texture is sandy loam, loam, or fine sandy loam. Structure is weak or moderate medium subangular blocky, or the horizon is massive.

The IIC horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 3 or 4. Texture ranges from silty clay loam to clay.

The Elmridge soils in this county are taxadjuncts to the Elmridge series because they have lower base saturation than is typical for the series. This difference, however, does not greatly affect the use or management of these soils.

Fluvaquents

Fluvaquents are deep, somewhat poorly drained to very poorly drained soils that formed in recent alluvium. They are on flood plains adjacent to streams, and they are saturated with water some part of the year. Slope ranges from 0 to 3 percent.

Because of the variability of Fluvaquents, a typical pedon is not provided.

Fluvaquents are more than 5 feet deep to bedrock. Coarse fragments make up 2 to 50 percent by volume. These soils are medium acid to neutral throughout.

The A horizon has hue of 7.5YR to 5Y, value of 3 or 4, and chroma of 1 or 2. Texture ranges from silt loam to sandy loam, and is gravelly in places. The A horizon is 6 to 15 inches thick.

The C horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 1 to 4. In some pedons hue is 5BG or 5G. Mottles are few to many and faint to distinct. Texture ranges from silty clay loam to coarse sand and is gravelly or very gravelly in places. Some pedons have thick or thin strata of different textures. Some pedons have a buried A horizon.

Fredon Series

The Fredon series consists of deep, somewhat poorly drained or poorly drained soils in depressional areas on outwash plains and terraces. These soils formed in water-sorted sand and gravel deposits. Slope ranges from 0 to 4 percent.

Typical pedon of Fredon silt loam, 0 to 4 percent slope; in a woodlot, 150 feet north of New York Route 150, 30 feet east of little league park; town of Schodack:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable; many roots; reddish brown root stains; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.
B21—8 to 16 inches; pale olive (5Y 6/3) gravelly silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; common roots; 15 percent coarse fragments; strongly acid; clear wavy boundary.
B22g—16 to 23 inches; light olive gray (5Y 6/2) very fine sandy loam; many coarse distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; few roots; 5 percent coarse fragments; strongly acid; abrupt wavy boundary.
IIC1—23 to 28 inches; very dark grayish brown (10YR 3/2) very gravelly coarse sand; single grain; loose; few roots; 60 percent fine gravel; medium acid; abrupt smooth boundary.
IIC2—28 to 60 inches; very dark grayish brown (10YR 3/2) sand; single grain; loose; less than 5 percent coarse fragments; neutral.

The thickness of the solum and the depth to stratified sand and gravel range from 22 to 35 inches. Depth to bedrock is more than 6 feet. Coarse fragments make up 5 to 25 percent of the volume of the solum and 5 to 60 percent of the substratum. Reaction is strongly acid to neutral in the solum and medium acid to moderately alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Texture ranges from fine sandy loam to silt loam.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. Texture of the fine earth fraction ranges from sandy loam to silt loam. Structure is prismatic or subangular blocky.

The IIC horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4. This horizon is stratified sand and gravel, and texture ranges from loamy fine sand to very gravelly coarse sand.

Glover Series

The Glover series consists of shallow, somewhat excessively drained soils on hillsides and mountain ridges of the grit plateau. These soils formed in glacial till that was derived mainly from sandstone. Slope ranges from 3 to 50 percent.

Typical pedon of Glover loam in an area of Glover very stony loam, very rocky, sloping; in a wooded area, 300 feet east of fire tower on Seven Hill Road; town of Stephentown:

O1—1 inch to 0; undecomposed leaf litter.
A1—0 to 2 inches; black (10YR 2/1) loam; weak fine granular structure; very friable; many fine, medium, and coarse roots; 10 percent coarse fragments; very strongly acid; abrupt smooth boundary.
B21—2 to 4 inches; brown (7.5YR 4/2) loam; moderate medium granular structure; friable; many fine and medium roots; 10 percent coarse fragments; very strongly acid; clear wavy boundary.
B22—4 to 18 inches; brown (7.5YR 4/4) loam; moderate medium granular structure; friable; many fine and coarse roots; 10 percent coarse fragments; very strongly acid.
R—18 inches; graywacke sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. Coarse fragments, mainly of sandstone, make up 5 to 15 percent of the volume of the surface layer and 5 to 30 percent of the subsoil. In unlimed areas, reaction ranges from very strongly acid to medium acid.

The A1 horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is loam or silt loam.

The B horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Texture is loam or silt loam and is channery in places.

The Glover soils in this survey area are taxadjuncts to the Glover series because they lack a spodic horizon and have hue of 7.5YR in the B horizon. These differences, however, do not greatly affect the use or management of these soils.

Hamlin Series

The Hamlin series consists of deep, well drained soils on flood plains. These soils formed in recent alluvium. Slope ranges from 0 to 3 percent.

Typical pedon of Hamlin silt loam, 0 to 3 percent slopes; in a cultivated field, 1 mile south of Rensselaer city limits, 2,000 feet west of New York Route 9J; town of East Greenbush:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many roots; neutral; abrupt smooth boundary.
B2—9 to 34 inches; brown (10YR 4/3) silt loam; weak very fine subangular blocky structure; friable; common roots; neutral; clear smooth boundary.
C—34 to 60 inches; dark grayish brown (10YR 4/2) silt loam; massive; friable; neutral.

The solum ranges from 24 to 40 inches in thickness. Depth to bedrock is more than 60 inches. Coarse fragments make up 0 to 3 percent of the volume of the upper 40 inches and 0 to 10 percent below a depth of 40 inches. Reaction is strongly acid to neutral in the solum and medium acid to mildly alkaline in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or very fine sandy loam.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or very fine sandy loam. Structure is weak or moderate subangular blocky or prismatic.

The C horizon has hue of 7.5YR to 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or very fine sandy loam.

Haven Series

The Haven series consists of deep, well drained soils on outwash plains and deltas. These soils formed in glacial outwash and deltaic deposits. Slope ranges from 0 to 8 percent.

Typical pedon of Haven silt loam, 0 to 3 percent slopes; 50 feet east of South Post Road, 1 mile north of junction of South Post Road and Maple Hill Road; town of Schodack:

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

B21—10 to 20 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; common roots; strongly acid; abrupt wavy boundary.

B22—20 to 25 inches; yellowish brown (10YR 5/4) very fine sandy loam; weak medium subangular blocky structure; friable; few roots; 2 percent coarse fragments; strongly acid; abrupt wavy boundary.

B23—25 to 30 inches; yellowish brown (10YR 5/4) silt loam; few fine faint yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; few roots; strongly acid; abrupt smooth boundary.

IIC—30 to 60 inches; dark brown (10YR 4/3) gravelly loamy sand; single grain; loose; 15 percent coarse fragments; strongly acid.

The solum ranges from 18 to 36 inches in thickness. Depth to bedrock is greater than 5 feet. Gravel content ranges from 2 to 15 percent of the volume of the A and B horizons and from 10 to 55 percent of the IIC horizon. In unlimed areas, reaction ranges from very strongly acid to medium acid in the solum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Texture ranges from loam or silt loam to very fine sandy loam.

The B horizon has hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 4 to 6. Texture of the fine earth fraction is loam or silt loam. Some pedons are not mottled above the C horizon.

The C horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 2 to 6. Texture ranges from loamy fine sandy or sand to stratified very gravelly sand.

Hoosic Series

The Hoosic series consists of deep, well drained to excessively drained soils on terraces, kames, and outwash plains. These soils formed in glacial outwash that was derived from shale, slate, and sandstone. Slope ranges from 0 to 50 percent.

Typical pedon of Hoosic gravelly sandy loam, 0 to 3 percent slopes; in an idle field, 150 feet west of Requate Road, 300 feet south of Route 67, and 1 1/2 miles east of Valley Falls; town of Pittstown:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam; moderate fine granular structure; very friable; many fine roots; 30 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—9 to 15 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam; weak fine and medium subangular blocky structure; friable; common fine roots; 30 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—15 to 23 inches; dark yellowish brown (10YR 4/4) very gravelly sandy loam; weak fine granular structure; very friable; few fine roots; 40 percent coarse fragments; strongly acid; clear wavy boundary.

IIC—23 to 60 inches; brown (10YR 4/3) very gravelly sand; single grain; loose; 55 percent coarse fragments; strongly acid.

The solum ranges from 14 to 36 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 15 to 50 percent of the volume of the solum and 35 to 65 percent of the substratum. Reaction is very strongly acid or strongly acid above the IIC horizon, unless the soil has been limed, and very strongly acid to medium acid in the IIC horizon.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is gravelly silt loam to gravelly sandy loam.

The B horizon has hue of 7.5YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. Texture of the fine earth fraction is sandy loam to loam. Some pedons have a B3 horizon that is loamy sand to sand in the fine earth fraction. Structure is granular or subangular blocky.

The C horizon has hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 2 to 4. Texture of the C horizon ranges from loamy sand to stratified sand and gravel.

Hudson Series

The Hudson series consists of deep, moderately well drained soils on dissected lake plains. These soils formed in lacustrine silt and clay. Slope ranges from 3 to 45 percent.

Typical pedon of Hudson silt loam, 3 to 8 percent slopes; in a hayfield, 1/2 mile north of intersection of county Routes 1 and 2, 1/4 mile west of county Route 1; town of Schodack:

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

A2—5 to 8 inches; brown (10YR 5/3) silt loam; weak thick platy structure; friable; many roots; slightly acid; clear wavy boundary.

B&A—8 to 16 inches; yellowish brown (10YR 5/4) silty clay; moderate very coarse prismatic structure parting to moderate medium subangular blocky; firm, sticky, plastic; brown (10YR 5/3) coatings on peds; neutral; clear wavy boundary.

B2t—16 to 28 inches; brown (10YR 5/3) silty clay; common medium distinct gray (10YR 6/1) and yellowish brown (10YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; firm, sticky, plastic; few roots; continuous clay films on peds; neutral; clear wavy boundary.

C—28 to 60 inches; mixed grayish brown (2.5Y 5/2) and light olive brown (2.5Y 5/4) silty clay; moderate medium platy structure as a result of varved sediments; firm, sticky, plastic; few roots in upper part; strongly effervescent; moderately alkaline.

The solum ranges from 20 to 60 inches in thickness. Depth to carbonates ranges from 20 to 70 inches. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 3 percent of the volume of the A horizon and 0 to 10 percent of the B and C horizons. Reaction ranges from strongly acid to neutral in the Ap, A2, and B&A horizons; from medium acid to mildly alkaline in the B2 horizon; and from neutral to moderately alkaline in the C horizon.

The Ap and A1 horizons have hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 2 or 3. Texture is silt loam to silty clay loam. Structure is weak to strong fine or medium granular or subangular blocky. Consistence is friable or very friable.

The A2 horizon has hue of 7.5YR to 5Y, value of 5 or 6, and chroma of 2 or 3. It is mottled in some pedons. Texture is silt loam or silty clay loam. The A2 horizon has weak or moderate subangular blocky or platy structure and is very friable to firm.

The B&A horizon is similar to the B2t horizon in the B part and to the A2 horizon in the A part. Some pedons have few to many faint mottles.

The Bt horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 4 and is mottled. In pedons having matrix chroma of 2, the color is lithochromic and is not evidence of an aquic moisture regime. The B horizon is mainly silty clay loam or silty clay with subhorizons of silt loam to clay in some pedons. Structure is moderate or strong medium or coarse angular or subangular blocky with or without coarse or very coarse prisms. Consistence is firm or very firm. Some pedons that have a thicker solum have a B3 horizon that differs from the Bt horizon mainly in containing free carbonates.

The C horizon has hue of 5YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It ranges from silt loam to clay. The material is massive or has platy structure inherited from the varved sediments.

Limerick Series

The Limerick series consists of deep, poorly drained soils on flood plains. These soils formed in alluvial deposits dominated by silt and very fine sand. Slope ranges from 0 to 3 percent.

Typical pedon of Limerick silt loam, 0 to 3 percent slopes; in a cornfield, 200 feet east of railroad tracks, 50 feet south of Staats Island Road; town of Schodack:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; very few fine distinct yellowish brown (10YR 5/4) mottles; moderate medium granular structure; friable; many roots; neutral; abrupt smooth boundary.

C1g—8 to 22 inches; grayish brown (2.5Y 5/2) silt loam; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium platy structure; friable; few roots; slightly acid; clear wavy boundary.

C2g—22 to 36 inches; grayish brown (2.5Y 5/2) very fine sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly plastic, slightly sticky; slightly acid; clear wavy boundary.

C3g—36 to 60 inches; grayish brown (2.5Y 5/2) silt loam; many coarse prominent strong brown (7.5YR 5/6) mottles; massive; friable, slightly plastic, slightly sticky; slightly acid.

Depth to bedrock is more than 5 feet. Reaction ranges from strongly acid to neutral in the surface layer and medium acid to neutral in the substratum. Coarse fragments are few or absent throughout the soil.

The Ap horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 2 or 3. Texture is silt loam or very fine sandy loam. Consistence is friable or very friable.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. Structure is weak to moderate platy or weak subangular blocky, or the material is massive.

Loxley Series

The Loxley series consists of deep, very poorly drained organic soils in depressions on the uplands of the grit plateau. These soils formed primarily in herbaceous plant remnants and some woody fragments. Thickness of the organic material is more than 51 inches. Slope ranges from 0 to 1 percent.

Typical pedon of Loxley muck in an area of Loxley and Beseman mucks, 0 to 1 percent slopes; 300 feet east of county Route 42, 1.5 miles southwest of the junction of county Routes 42 and 41; town of Berlin:

Oa1—0 to 5 inches; muck (sapric material), very dark brown (10YR 2/2) broken face and pressed; about 10 percent fiber, none after rubbing; weak fine granular structure; nonsticky, slightly plastic; many roots; very strongly acid; abrupt smooth boundary.

Oa2—5 to 16 inches; muck (sapric material), black (5YR 2/1) broken face and pressed; about 5 percent fiber, none after rubbing; weak medium granular structure; nonsticky, slightly plastic; few roots; very strongly acid; clear smooth boundary.

Oa3—16 to 50 inches; muck (sapric material), dark reddish brown (5YR 3/2) broken face, dark reddish brown (5YR 2/2) pressed; about 15 percent fiber, 5 percent rubbed; massive; slightly sticky, slightly plastic; very strongly acid; clear smooth boundary.

Oa4—50 to 60 inches; muck (sapric material), very dark grayish brown (10YR 3/2) broken face and pressed; about 20 percent fiber, 5 percent rubbed; massive; nonsticky, slightly plastic; strongly acid.

Thickness of the organic layers is more than 51 inches. Reaction ranges from strongly acid to extremely acid throughout the soil. Woody fragments make up as much as 30 percent of the volume of the subsurface and bottom tiers.

The surface tier is black or very dark brown sapric material with hue of 5YR to 10YR.

The subsurface tier has hue of 5YR, 7.5YR, or 10YR; value of 2 to 4; and chroma of 2 to 4.

The bottom tier has hue of 5YR to 10YR, value of 2 or 3, and chroma of 2 or 3.

Macomber Series

The Macomber series consists of mderately deep, well drained soils in the Taconic Mountains. These soils formed in glacial till that was derived from phyllite, slate, and some shale. Slope ranges from 3 to 60 percent.

Typical pedon of Macomber slaty silt loam in an area of Macomber-Taconic slaty silt loams, very rocky, steep; in a forested area, 1,700 feet along dirt road junction of Prosser Hollow Road and Lewis Hollow Road, 400 feet north of dirt road; town of Petersburg:

O1—1 inch to 0; partially decomposed organic material including leaves and twigs.

A1—0 to 3 inches; olive brown (2.5Y 4/4) slaty silt loam; weak medium granular structure; friable; common fine and medium roots; 15 percent coarse fragements; very strongly acid; abrupt wavy boundary.

B21—3 to 11 inches; light olive brown (2.5Y 5/4) very slaty loam; few fine distinct brownish yellow (10YR 6/8) lithochromic mottles; weak fine subangular blocky structure; friable; few fine and medium roots; 40 percent coarse fragments; very strongly acid; clear wavy boundary.

B22—11 to 23 inches; yellowish brown (10YR 5/6) very slaty loam; few fine faint yellowish brown (10YR 5/8) lithochromic mottles; weak fine and medium subangular blocky structure; friable; 50 percent coarse fragements; very strongly acid; abrupt wavy boundary.

R—23 inches; fractured and folded dark greenish gray (5G 4/1) phyllite.

The solum ranges from 11 to 30 inches in thickness. Depth to bedrock ranges from 20 to 40 inches. Coarse fragments make up 15 to 35 percent of the A horizon and 35 to 60 percent of the B horizon. Reaction is very strongly acid throughout the soil.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 4. Texture of the fine earth fraction is mainly silt loam. Structure is weak or moderate very fine, fine, or medium granular. Consistence is friable or very friable.

The B horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 3 to 6. Texture of the fine earth fraction is silt loam or loam. Structure is weak or moderate fine or medium subangular blocky.

Some pedons have a C horizon that has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 6. Texture of the fine earth fraction is silt loam or loam. The horizon is 40 to 65 percent coarse fragements. Consistence is friable or firm.

Madalin Series

The Madalin series consists of deep, poorly drained or very poorly drained soils in nearly level to depressional areas. These soils formed in silt and clay deposits. Slope ranges from 0 to 3 percent.

Typical pedon of Madalin silt loam, 0 to 3 percent slopes; in a woodlot, 900 feet north of county Route 2, 1/2 mile east of the intersection of Route 2 and railroad tracts; town of Schodack:

Ap—0 to 7 inches; very dark brown (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

A2—7 to 11 inches; gray (10YR 5/1) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; moderate fine angular blocky structure; firm, plastic, slightly sticky; common fine and medium roots; very strongly acid; clear wavy boundary.

B21tg—11 to 22 inches; grayish brown (10YR 5/2) silty clay; many medium distinct yellowish brown (10YR 5/6) mottles and common fine distinct gray (N 6/0) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm, plastic, slightly sticky; common fine and medium roots; gray (10YR 5/1) continuous clay films on peds; slightly acid; gradual wavy boundary

B22tg—22 to 39 inches; grayish brown (10YR 5/2) silty clay; common medium distinct yellowish brown (10YR 5/4) mottles and common fine faint gray (10YR 5/1) mottles; moderate very coarse prismatic structure parting to moderate medium angular blocky; firm, plastic, sticky; few fine roots; gray (10YR 5/1) continuous clay films on peds; neutral; clear wavy boundary.

C—39 to 60 inches; dark grayish brown (10YR 4/2) silty clay; common medium distinct yellowish brown (10YR 5/4) mottles and common medium faint brown (10YR 4/3) mottles; weak very coarse prismatic structure parting to moderate medium platy; firm, plastic, sticky; gray (10YR 6/1) discontinuous coatings on peds; strongly effervescent; mildly alkaline.

The thickness of the solum and the depth to carbonates ranges from 24 to 40 inches. Depth to bedrock is greater than 5 feet. Reaction is very strongly acid to mildly alkaline in the A horizon, medium acid to mildly alkaline in the B horizon, and mildy alkaline or moderate alkaline in the C horizon.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1. It is silt loam or silty clay loam. The A2 horizon has hue of 10YR, value of 5, and chroma of 1 or 2. Some pedons do not have an A2 horizon.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. It is silty clay loam, silty clay, or clay.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. It is silty clay loam, silty clay, or clay.

Manlius Series

The Manlius series consists of moderately deep, well drained soils on bedrock-controlled uplands. These soils formed in glacial till that was derived mainly from shale and slate. Slope ranges from 1 to 16 percent.

Typical pedon of Manlius shaly silt loam in an area of Nassau-Manlius complex, rolling; 400 feet east of Lyons Lake Road, 2,000 feet north of U.S. Route 20; town of Nassau:

Ap—0 to 8 inches; brown (10YR 4/3) shaly silt loam; moderate fine and medium granular structure; very friable; many fine roots; 30 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—8 to 15 inches; yellowish brown (10YR 5/4) very shaly silt loam; weak fine subangular blocky structure; firm in place, friable when removed; common fine roots; 40 percent coarse fragments; strongly acid; clear wavy boundary.

B22—15 to 23 inches; dark yellowish brown (10YR 4/4) very shaly silt loam; weak fine subangular blocky structure; firm; few fine roots; 60 percent coarse fragments; strongly acid; gradual wavy boundary.

C—23 to 30 inches; dark yellowish brown (10YR 4/4) very shaly silt loam; vertically oriented weak thin platy structure; firm; few fine roots; 60 percent coarse fragments; strongly acid; gradual irregular boundary.

R—30 inches; olive gray (5Y 5/2) shale bedrock; dark yellowish brown (10YR 4/4) plate surfaces; folded and vertically bedded.

The solum ranges from 15 to 30 inches in thickness. Depth to bedrock ranges from 20 to 40 inches. Coarse fragments, mainly of shale and slate, make up 15 to 35 percent of the volume of the Ap horizon and increase to 60 percent in the lower part of the B horizon and in the C horizon. In unlimed areas, reaction ranges from strongly acid to extremely acid in the solum and from very strongly acid to slightly acid in the substratum. The fine earth fraction is loam or silt loam throughout the soil.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 or 4. Structure is granular or subangular blocky.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. This horizon is massive or has platy structure inherited from the shale bedrock. Consistence is friable or firm.

Nassau Series

The Nassau series consists of shallow, somewhat excessively drained soils on bedrock-controlled uplands. These soils formed in glacial till that was derived mainly from shale and slate. Slope ranges from 1 to 50 percent.

Typical pedon of Nassau very shaly silt loam in an area of Nassau-Manlius complex, rolling; in a meadow, 300 feet east of Lyons Lake Road and 2,000 feet north of U.S. Route 20; town of Nassau:

Ap—0 to 7 inches; dark brown (10YR 3/3) very shaly silt loam; moderate fine granular structure; very friable; many fine roots; 45 percent shale fragments; strongly acid; abrupt smooth boundary.

B2—7 to 15 inches; yellowish brown (10YR 5/4) very shaly loam; weak fine and medium granular structure; friable; many fine roots; common fine pores; 60 percent shale fragments; strongly acid; gradual wavy boundary.
IIR—15 inches; olive gray (5Y 5/2) folded thin vertically bedded shale; dark yellowish brown (10YR 4/4) plate faces.

Thickness of the solum and depth to bedrock range from 10 to 20 inches. The bedrock is mainly shale or slate. Coarse fragments make up 25 to 50 percent, by volume, of the A horizon and 35 to 70 percent of the B horizon. In unlimed areas, reaction in the solum is strongly acid or very strongly acid.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 or 3. Texture of the fine earth fraction is loam or silt loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. Texture is silt loam or loam.

Some pedons have a C horizon that has hue, value, chroma, and texture similar to those of the B horizon.

Occum Variant

The Occum variant consists of deep, moderately well drained soils on flood plains. These soils formed in recent alluvium. Slope ranges from 0 to 3 percent.

Typical pedon of Occum variant silt loam in an area of Occum Variant-Barbour Variant complex, 0 to 3 percent slopes; east of Sugarloaf Hill, 500 feet east of New York Route 22, 1,500 feet south of Toad Point Road; town of Petersburg:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots and few medium roots; 2 percent coarse fragments; strongly acid; abrupt smooth boundary.
B21—8 to 20 inches; light olive brown (2.5Y 5/4) silt loam; weak fine subangular blocky structure; very friable; common fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
B22—20 to 27 inches; brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; very friable; common fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
B3—27 to 30 inches; gray (5Y 5/1) fine sandy loam; common medium distinct brown (10YR 4/3) mottles and few fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; 2 percent coarse fragments; strongly acid; abrupt smooth boundary.
IIC1—30 to 48 inches; dark grayish brown (2.5Y 4/2) very gravelly loamy sand; single grain; loose; few fine roots; 40 percent coarse fragments; strongly acid; clear smooth boundary.
IIC2—48 to 60 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; 50 percent coarse fragments; medium acid.

The solum ranges from 20 to 40 inches in thickness. Depth to bedrock is more than 60 inches. Coarse fragments make up 0 to 15 percent of the solum and 2 to 50 percent of the IIC horizon. Reaction ranges from strongly acid to medium acid throughout.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. It is silt loam, fine sandy loam, or loam.

The B horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4. It ranges from silt loam to sandy loam. It has subangular blocky structure or is massive.

The IIC horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 6. It ranges from loamy sand to sand in the fine earth fraction and includes thin layers of loamy fine sand, sandy loam, and silt loam. It is single grained or massive.

Palms Series

The Palms series consists of very poorly drained organic soils in bogs and swamps. These soils formed in well decomposed organic material underlain by loamy mineral material at a depth of 16 to 50 inches. Slope is 0 to 1 percent.

Typical pedon of Palms muck, 0 to 1 percent slopes; in a wooded area, 1/2 mile east of County Road 3, 3,000 feet north of New York Thruway, 3,700 feet west of New York Route 9; town of Schodack:

Oa1—0 to 4 inches; muck (sapric material), black (10YR 2/1) broken face, very dark brown (10YR 2/2) rubbed; 15 percent fiber, about 5 percent rubbed; medium fine granular structure; friable, nonsticky, slightly plastic; 20 percent silt; common medium roots; slightly acid; abrupt smooth boundary.
Oa2—4 to 18 inches; muck (sapric material), dark reddish brown (5YR 2/2) broken face and pressed; 30 percent fiber, 8 percent rubbed; massive; slightly plastic, sticky; 10 percent silt; neutral; abrupt smooth boundary.
IIC1g—18 to 24 inches; dark gray (10YR 4/1) silt loam; massive; plastic, slightly sticky; neutral; abrupt smooth boundary.
IIIC2g—24 to 60 inches; gray (10YR 5/1) fine sandy loam; massive; nonplastic, nonsticky; neutral.

Depth to the IIC horizon ranges from 16 to 50 inches. Depth to bedrock is more than 5 feet. Reaction is strongly acid to mildly alkaline in the organic material and slightly acid to moderately alkaline in the mineral substratum.

The Oa1 horizon is mainly black or very dark brown sapric material. The Oa2 horizon is neutral or has hue of

5YR to 10YR; value is 2 or 3, and chroma is 0 to 3. These layers are mainly sapric, but some pedons have layers of hemic material that total as much as 10 inches in thickness and layers of fibric material as much as 5 inches in thickness.

The IIC horizon has hue of 10YR to 2.5Y, value of 4 or 5, and chroma of 1 or 2. It ranges from fine sandy loam to silty clay loam.

Pittstown Series

The Pittstown series consists of deep, moderately well drained soils on glaciated uplands. These soils formed in glacial till that was derived from shale, slate, and sandstone. These soils have a dense fragipan in the substratum. Slope ranges from 0 to 35 percent.

Typical pedon of Pittstown gravelly silt loam, 3 to 8 percent slopes; in an idle crop field, 350 feet north of abandoned house site at the end of Woods Road, 3,400 feet north of intersection of County Route 111 and Tomhannock-West Hoosick Road; town of Pittstown:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) gravelly silt loam; moderate very fine granular structure; very friable; many fine roots; 20 percent coarse fragments; medium acid; abrupt smooth boundary.

B21—9 to 17 inches; yellowish brown (10YR 5/4) gravelly silt loam; weak very fine subangular blocky structure; friable; many fine roots; 25 percent coarse fragments; medium acid; clear wavy boundary.

B22—17 to 24 inches; light olive brown (2.5Y 5/4) gravelly silt loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles and common fine distinct gray (5Y 5/1) mottles; weak fine subangular blocky structure; friable; common fine roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—24 to 60 inches; olive (5Y 4/3) gravelly silt loam; common medium distinct yellowish brown (10YR 5/6) mottles and many fine and medium distinct gray (5Y 5/1) mottles; moderate thin and medium platy structure parting to fine subangular blocky; firm, very brittle; thin clay films on top of peds in upper part; gray (10YR 6/1) polygon streaks with yellowish red (5YR 5/8) borders; 30 percent coarse fragments; strongly acid.

The thickness of the solum and the depth to the fragipan range from 15 to 30 inches. The depth to bedrock is more than 60 inches. Coarse fragments make up 5 to 25 percent, by volume, of the solum and 10 to 30 percent of the substratum. In unlimed areas, reaction ranges from very strongly acid to medium acid throughout the soil.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. Texture is loam or silt loam.

The B horizon has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 3 or 4. Texture of the fine earth fraction is loam, silt loam, or very fine sandy loam.

Some pedons have an A'2 horizon that has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3. Texture of the fine earth fraction is loam or silt loam.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 or 3. Texture of the fine earth fraction is silt loam, loam, or very fine sandy loam. Consistence is firm to extremely firm.

Raynham Series

The Raynham series consists of deep, somewhat poorly drained or poorly drained soils on glacial lake plains and stream terraces. These soils formed in silt and very fine sand. Slope ranges from 0 to 5 percent.

Typical pedon of Raynham silt loam, 0 to 5 percent slopes; in a hayfield, 100 feet north of Hansen Road, 1/2 mile west of New York Route 40; town of Schaghticoke:

Ap1—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

Ap2—5 to 14 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium subangular blocky structure; very friable; many fine roots; many fine distinct reddish brown (5YR 4/4) root stains; slightly acid; abrupt smooth boundary.

B21—14 to 19 inches; pale brown (10YR 6/3) silt loam; few fine faint brown (10YR 4/3) and grayish brown (2.5Y 5/2) mottles; weak thick platy structure parting to weak fine subangular blocky; friable; few fine roots; 2 percent coarse fragments; neutral; clear smooth boundary.

B22g—19 to 26 inches; grayish brown (2.5Y 5/2) loam; common fine faint dark yellowish brown (10YR 4/4) mottles and light brownish gray (10YR 6/2) mottles; moderate thick platy structure parting to weak fine subangular blocky; friable; few fine roots; 3 percent fine pebbles; neutral; clear smooth boundary.

Cg—26 to 60 inches; light olive gray (5Y 6/2) silt loam; many medium faint dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; weak thin and medium platy structure; firm; neutral.

The solum ranges from 16 to 37 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 3 percent throughout. Reaction is strongly acid to neutral in the surface layer and subsoil and medium acid to mildly alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 2. It is loam or very fine sandy loam.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It is loam, silt loam, or very fine sandy loam. Consistence is friable or firm.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is silt loam or very fine sandy loam. The C horizon is friable or firm.

The Raynham soils in this county are taxadjuncts to the Raynham series because they have a higher content of sand in the control section than is defined for the series. This difference, however, does not affect the use or management of these soils.

Rhinebeck Series

The Rhinebeck series consists of deep, somewhat poorly drained soils on lake plains. These soils formed in lake-laid deposits of silt and clay. Slope ranges from 0 to 8 percent.

Typical pedon of Rhinebeck silt loam, 3 to 8 percent slopes; in a hayfield, 150 feet east of field road, 1/4 mile north of County Route 2, 3/8 mile west of County Route 1; town of Schodack:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; few reddish brown mottles along root channels; moderate medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

A2—8 to 11 inches; light brownish gray (10YR 6/2) silty clay loam; common fine faint light gray (10YR 6/1) mottles and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many fine roots; medium acid; clear wavy boundary.

B21t—11 to 16 inches; brown (10YR 5/3) silty clay; common medium distinct grayish brown (10YR 5/2) and dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm, slightly sticky, plastic; common fine roots; gray (10YR 5/1) continuous clay films on peds; strongly acid; clear wavy boundary.

B22t—16 to 36 inches; dark grayish brown (10YR 4/2) silty clay; moderate medium distinct dark yellowish brown (10YR 4/4) and gray (10YR 6/1) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; firm, slightly sticky, plastic; few fine roots; light gray (10YR 6/1) continuous clay films on peds; neutral; clear wavy boundary.

C—36 to 62 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) and grayish brown (10YR 5/2) mottles; weak very coarse prismatic structure parting to moderate medium platy; firm, slightly sticky, plastic; few fine roots in upper part; gray (10YR 6/1) prism faces; strongly effervescent; mildly alkaline.

The solum ranges from 20 to 40 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 10 percent throughout. Reaction is strongly acid to neutral in the surface layer, strongly acid to mildly alkaline in the subsoil, and slightly acid to moderately alkaline in the substratum. Depth to carbonates is 20 to 40 inches.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2. Texture is silt loam or silty clay loam. Structure is granular or subangular blocky. Consistence is friable or very friable.

The A2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3 and is mottled. Texture is silt loam or silty clay loam. Consistence is friable or firm.

The B2 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3. Texture is silty clay or silty clay loam. Structure is prismatic or angular or subangular blocky.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4. Texture is silty clay loam to clay. Structure is weak to moderate thin to thick platy within very coarse prisms. Consistence is firm or very firm.

Riverhead Series

The Riverhead series consists of deep, well drained soils on glacial outwash plains, terraces, and remnant beaches. These soils formed in glacial outwash that was derived mainly from slate, sandstone, and granite. Slope ranges from 0 to 15 percent.

Typical pedon of Riverhead fine sandy loam, 3 to 8 percent slopes; in a woodlot at north end of gravel pit, 500 feet east of Brookview Road, 500 feet north of Schodack town line; town of East Greenbush:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate fine granular structure; friable; many roots; 5 percent coarse fragments; strongly acid; clear smooth boundary.

B21—6 to 14 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; friable; common roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B22—14 to 35 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

IIC—35 to 60 inches; brown (10YR 4/3) gravelly loamy sand; single grain; loose; 20 percent coarse fragments; strongly acid.

The solum ranges from 22 to 36 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments, mainly of sandstone, slate, and granite, make up less than 15 percent of the volume of the solum, and 5 to 35 percent of the substratum. In unlimed areas, reaction is

extremely acid to medium acid in the solum and very strongly acid to neutral in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is fine sandy loam or sandy loam.

The B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. The B2 horizon is sandy loam or fine sandy loam. Some pedons have a B3 horizon that ranges from fine sandy loam to gravelly loamy sand.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6. Texture ranges from gravelly loamy sand to gravelly sand.

Saprists

Saprists are very poorly drained organic soils. These soils are ponded with water most of the year. Saprists formed in organic material and consist of almost completely decomposed plant remains. Slope is less than 1 percent.

Because of the variability of Saprists, a typical pedon is not provided.

Thickness of the organic material over mineral material is more than 16 inches. Depth to bedrock is more than 5 feet. Woody fragments, consisting of twigs, branches, logs, or stumps, make up as much as 30 percent of the volume of some pedons. Reaction is strongly acid to mildly alkaline in the organic material and slightly acid to moderately alkaline in the mineral material.

The organic material is neutral or has hue of 5YR to 10YR; value is 2 or 3, and chroma is 0 to 3. It is dominantly sapric material but in places contains thin layers of hemic and fibric material.

The underlying mineral material has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 or 2. Texture ranges from gravelly loamy sand to silty clay loam.

Scio Series

The Scio series consists of deep, moderately well drained soils on lake plains and old stream terraces. These soils formed in lacustrine or old alluvial deposits that have a high content of silt and very fine sand. Slope ranges from 0 to 8 percent.

Typical pedon of Scio very fine sandy loam, 0 to 3 percent slopes; in a nursery, 2,000 feet west of Verbeck Avenue, 2,000 feet south of Washington County line; town of Schaghticoke:

Ap—0 to 12 inches; dark brown (10YR 3/3) very fine sandy loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

B21—12 to 23 inches; light olive brown (2.5Y 5/4) very fine sandy loam; common medium distinct gray (10YR 6/1) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very friable; common roots; medium acid; clear wavy boundary.

B22—23 to 41 inches; light olive brown (2.5Y 5/4) very fine sandy loam; few medium distinct gray (10YR 6/1) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very friable; few roots; medium acid; abrupt smooth boundary.

IIC—41 to 60 inches; olive brown (2.5Y 4/4) sand; single grain; loose; slightly acid.

The solum ranges from 24 to 42 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 3 percent of the volume of the surface layer and subsoil and up to 55 percent of the substratum below a depth of 40 inches. In unlimed areas, reaction is very strongly acid to medium acid in the solum and strongly acid to mildly alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 3. Texture ranges from very fine sandy loam to silt loam.

The B horizon has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 3 to 6. Texture is very fine sandy loam or silt loam.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. It is very fine sandy loam or silt loam above a depth of 40 inches and sand below that depth. In some pedons this horizon is stratified sand, gravel, and loamy material below a depth of 40 inches.

Scriba Series

The Scriba series consists of deep, somewhat poorly drained soils on lower slopes in the glaciated uplands. These soils formed in glacial till that was derived mainly from shale, slate, and sandstone. Slope ranges from 0 to 15 percent.

Typical pedon of Scriba silt loam, 3 to 8 percent slopes; in an idle hayfield, 700 feet west of Morgan Road, 1/4 mile south of New York Route 151; town of East Greenbush:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, gray (10YR 6/1) dry; moderate medium granular structure; friable; many roots; 10 percent coarse fragments; slightly acid; abrupt smooth boundary.

A2g—10 to 13 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common roots; 10 percent coarse fragments; slightly acid; clear wavy boundary.

B2—13 to 21 inches; brown (10YR 5/3) silt loam; many medium faint yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles; moderate medium subangular blocky structure; friable; common roots; 10 percent coarse fragments; slightly acid; clear wavy boundary.

Bx1—21 to 36 inches; yellowish brown (10YR 5/4) gravelly silt loam; many medium faint yellowish

brown (10YR 5/6) and gray (10YR 6/1) mottles; moderate very coarse prismatic structure parting to moderate thick platy; very firm, brittle; 1/2 inch wide gray (N 5/0) streaks with 1/8 inch thick red (2.5YR 5/6) linings between prisms; 15 percent coarse fragments; neutral; clear wavy boundary.

Bx2—36 to 50 inches; light olive brown (2.5Y 5/4) gravelly silt loam; common medium distinct yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles; moderate very coarse prismatic structure parting to moderate very thick platy; very firm, brittle; 1/2 inch wide gray (N 5/0) streaks with 1/8 inch thick red (2.5YR 5/6) linings between prisms; 15 percent coarse fragments; neutral; clear wavy boundary.

C—50 to 60 inches; light olive brown (2.5Y 5/4) gravelly silt loam; common medium distinct yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles; massive; very firm; 15 percent coarse fragments; neutral.

The solum ranges from 35 to 60 inches in thickness. Depth to bedrock is more than 60 inches. Depth to the top of the fragipan ranges from 12 to 21 inches. Coarse fragments, mainly of shale, slate, and sandstone, make up 10 to 30 percent of the volume of the surface layer and the upper part of the subsoil and 15 to 60 percent of the fragipan and the substratum. Reaction ranges from extremely acid to slightly acid in the A and B2 horizons, strongly acid to neutral in the Bx horizon, and strongly acid to moderately alkaline in the C horizon. Fine earth texture throughout the soil ranges from sandy loam to silt loam.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The A2 horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 or 2.

The B2 horizon has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 3 to 6.

The Bx and C horizons are neutral or have hue of 5YR to 5Y; value is 3 to 6, and chroma is 0 to 4.

Shaker Series

The Shaker series consists of deep, somewhat poorly drained to poorly drained soils on lake plains. These soils formed in lake-laid sediment in which moderately coarse textured material overlies fine textured material. The fine textured material is underlain by sandy sediment at a depth of more than 48 inches. Slope ranges from 0 to 4 percent.

Typical pedon of Shaker very fine sandy loam, sandy substratum, 0 to 4 percent slopes; in a hayfield, 660 feet west of New York Route 150, 1/4 mile southwest of intersection of Route 150 and Brookview Road; town of Schodack:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; moderate medium granular structure; friable; many roots; 3 percent coarse fragments; neutral; abrupt smooth boundary.

B21—9 to 15 inches; grayish brown (10YR 5/2) fine sandy loam; common fine distinct gray (10YR 6/1) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; common roots; slightly acid; clear wavy boundary.

B22—15 to 23 inches; dark brown (10YR 4/3) fine sandy loam; common medium distinct grayish brown (10YR 5/2) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; few roots; slightly acid; abrupt smooth boundary.

IIC1—23 to 48 inches; brown (10YR 4/3) silty clay; moderate medium angular blocky structure; firm, sticky, plastic; few discontinuous gray (N 5/0) coats on ped faces and pores; neutral; abrupt smooth boundary.

IIIC2—48 to 51 inches; dark grayish brown (10YR 4/2) loamy fine sand; common medium distinct dark yellowish brown (10YR 4/4) mottles; massive; very friable; neutral.

The solum ranges from 18 to 48 inches in thickness. Depth to contrasting clayey material ranges from 18 to 40 inches. Depth to the sandy substratum ranges from 48 to 72 inches. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 3 percent of the volume of the soil. In unlimed areas, reaction is strongly acid to slightly acid in the surface layer and subsoil, medium acid to neutral in the clayey substratum, and medium acid to mildly alkaline in the underlying sandy layers.

The Ap horizon has hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It is very fine sandy loam to sandy loam.

The B2 horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 or 3. It is very fine sandy loam to sandy loam.

The IIC horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 or 3. It is silty clay loam or clay.

The IIIC horizon has hue of 10YR, value of 4, and chroma of 2 to 4. Texture is mostly loamy fine sand with thin strata of loamy sand and fine sand.

Taconic Series

The Taconic series consists of shallow, well drained or somewhat excessively drained soils in the Taconic Mountains. These soils formed in glacial till that was derived from phyllite, slate, and some shale. Slope ranges from 3 to 60 percent.

Typical pedon of Taconic slaty silt loam in an area of Macomber-Taconic slaty silt loams, very rocky, very steep; about 1 mile southeast of the intersection of East Road and New York Route 22, 2,800 feet east of farmhouse; town of Stephentown:

A1—0 to 5 inches; dark brown (10YR 3/3) slaty silt loam; weak fine and medium granular structure; very friable; many fine and medium roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.
B21—5 to 8 inches; olive brown (2.5Y 4/4) very slaty silt loam; weak very fine subangular blocky structure; very friable; common fine roots; 35 percent coarse fragments; strongly acid; clear wavy boundary.
B22—8 to 10 inches; dark yellowish brown (10YR 4/6) very slaty silt loam; weak fine subangular blocky structure; friable; common fine roots; common fine pores; 45 percent coarse fragments; strongly acid; abrupt wavy boundary.
B23—10 to 14 inches; olive brown (2.5Y 4/4) very slaty silt loam; weak fine subangular blocky structure; friable; common fine roots; 55 percent coarse fragments; strongly acid; abrupt irregular boundary.
R—14 inches; fractured and folded gray phyllite.

The thickness of the solum and depth to bedrock range from 10 to 20 inches. Coarse fragments, mainly of slate, quartz, and phyllite, make up 10 to 35 percent of the A horizon and 35 to 60 percent of the B horizon. The soil is very strongly acid or strongly acid.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 2 or 3. It is slaty silt loam or slaty loam.

The B horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 6. Texture of the fine earth fraction is silt loam or loam. This horizon has weak or moderate very fine, fine, or medium subangular blocky structure and is very friable or friable.

Some pedons have a C horizon that has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. Texture of the fine earth fraction is silt loam or loam. This horizon is 45 to 65 percent coarse fragments. It has platy or angular blocky structure or is massive. Consistence is firm or friable.

Teel Series

The Teel series consists of deep, moderately well drained to somewhat poorly drained soils on flood plains. These soils formed in recent alluvium. Slope ranges from 0 to 3 percent.

Typical pedon of Teel silt loam, 0 to 3 percent slopes; in a cultivated field 50 feet south of Papscanee Island Road, 500 feet west of railroad tracks; town of Schodack:

Ap—0 to 12 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many roots; neutral; abrupt smooth boundary.
B21—12 to 18 inches; dark grayish brown (2.5Y 4/2) silt loam; weak medium subangular blocky structure; friable; common roots; neutral; clear wavy boundary.
B22—18 to 40 inches; dark grayish brown (2.5Y 4/2) silt loam; common medium distinct dark brown (7.5YR 4/4) mottles and few medium faint grayish brown (2.5Y 5/2) mottles; weak medium subangular blocky structure; friable; few roots; neutral; clear wavy boundary.
C—40 to 60 inches; dark gray (5Y 4/1) silt loam; many coarse distinct dark brown (7.5YR 4/4) mottles; weak medium platy structure; friable; few roots; neutral.

The solum ranges from 24 to 40 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 5 percent of the subsoil and 0 to 20 percent of the substratum. Reaction is strongly acid to neutral in the surface layer, strongly acid to mildly alkaline in the subsoil, and medium acid to mildly alkaline in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2. It is silt loam or very fine sandy loam. It has weak or moderate granular structure.

The B horizon has hue of 7.5YR to 2.5Y, value of 4, and chroma of 2 to 4. It is silt loam or very fine sandy loam. It has weak or moderate subangular blocky structure.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 4. It is silt loam to fine sandy loam. It has platy structure or is massive.

Udifluvents

Udifluvents are deep, well drained or moderately well drained soils that formed in recent alluvium. They are on flood plains of streams and may be flooded in almost any season. Slope ranges from 0 to 3 percent.

Because of the variability of Udifluvents, a typical pedon is not provided. Udifluvents have bedrock at a depth of more than 5 feet. They contain 2 to 40 percent coarse fragments. These soils are slightly acid to strongly acid throughout.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2. Texture ranges from silt loam to fine sandy loam, and is gravelly in places. The A horizon is 6 to 12 inches thick.

The C horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2. Mottles are faint or distinct. Texture ranges from silt loam to sand and is gravelly or very gravelly in places. The C horizon commonly contains thick or thin strata of different textures. Some pedons have a buried A horizon.

Udorthents

Udorthents consist of deep, excessively drained to moderately well drained loamy and sandy soils that formed in recently exposed excavations or recent fill deposits. They occur mostly on till plains and flood plains. Slope ranges from 0 to 5 percent.

Because of the variability of Udorthents, a typical pedon is not provided. These soils have little or no soil profile development. Udorthents are a few inches to more than 5 feet deep over bedrock. Gravel makes up 0 to 65 percent. These soils are very strongly acid to neutral in the substratum.

Udorthents range from strong brown to olive and are mottled in some pedons. Texture ranges from sand to silty clay loam and is gravelly or very gravelly in places.

Unadilla Series

The Unadilla series consists of deep, well drained soils on stream terraces, lake plains, and deltas. They formed in lacustrine or old alluvial deposits that have a high content of silt and very fine sand. Slope ranges from 0 to 15 percent.

Typical pedon of Unadilla silt loam, 3 to 8 percent slopes; in a cultivated field, 500 feet north of New York Route 67, 900 feet east of the Hudson River; town of Schaghticoke:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; friable; many fine and medium roots; neutral; abrupt smooth boundary.

B21—7 to 14 inches; yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; common fine roots; slightly acid; clear wavy boundary.

B22—14 to 33 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) very fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; strongly acid; gradual wavy boundary.

C—33 to 62 inches; brown (10YR 4/3) very fine sandy loam; massive; friable; few fine roots; 10 percent yellowish brown (10YR 5/4) very fine sand lenses in lower part; very strongly acid.

The solum ranges from 20 to 33 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up less than 2 percent of the volume of the surface layer and subsoil. Texture is silt loam or very fine sandy loam throughout. Below a depth of 40 inches, some pedons have thin lenses of material ranging from fine sand to silt or layers of gravel. In unlimed areas, reaction ranges from very strongly acid to medium acid in the solum and from very strongly acid to neutral in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B21 horizon has hue of 10YR, value of 4 or 5, and chroma of 4. The B22 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4.

Windsor Series

The Windsor series consists of deep, excessively drained soils on deltas, plains, and old stream terraces. They formed in deltaic and glacial outwash deposits that have a high sand content. Slope ranges from 0 to 40 percent.

Typical pedon of Windsor loamy sand, 3 to 8 percent slopes; 200 feet west of Berbec Road, 1,000 feet south of the Washington County line; town of Schaghticoke:

Ap—0 to 8 inches; dark brown (10YR 4/3) loamy sand; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

B21—8 to 16 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

B22—16 to 21 inches; dark yellowish brown (10YR 4/4) sand; single grain; loose; few fine roots; very strongly acid; clear wavy boundary.

C—21 to 60 inches; light olive brown (2.5Y 5/4) sand; single grain; loose; strongly acid.

The solum ranges from 20 to 30 inches in thickness. Depth to bedrock is more than 5 feet. Coarse fragments make up 0 to 10 percent of the volume of the solum, and 0 to 15 percent of the substratum. The sand fraction is mainly fine or medium. Reaction is very strongly acid to medium acid in the solum and very strongly acid to slightly acid in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. It is loamy sand or loamy fine sand.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. Texture ranges from loamy fine sand to sand. Structure is weak granular, or the material is single grained. Consistence is very friable or loose.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. Texture is fine sand or sand.

Formation of the Soils

The first part of this section describes the factors of soil formation and relates them to the formation of soils in Rensselaer County. The second part explains the processes of soil horizon development as they relate to soil formation in this county.

Factors of Soil Formation

Soils are products of weathering and other physical and chemical processes that act on parent material. The properties of the soil at any point on the earth depend on the physical and chemical composition of the parent material, the climate, the plant and animal life, the topography, and time. The relative influence of each of these factors of soil formation differs from place to place, and each modifies the effects of the other four. For example, the effects of climate and plant and animal life are influenced by topography and by the nature of the parent material. In some places the influence of one factor is dominant.

In this area, local differences in soils are largely the result of differences in parent material and topography. Table 21 shows the relationship between the soils and their landscape position, parent material, and drainage *(5)*.

Parent Material

Parent material is the unconsolidated earthy mass in which soils form. It determines the mineralogical and physical characteristics of the soil and contributes greatly to its chemical composition. Parent material also influences the rate that soilforming processes will act.

Most of the soils in Rensselaer County formed in deposits left as a result of glaciation *(8)*. Glacial till is the most extensive parent material. Less extensive are glaciolacustrine (lake-laid) sediment and glaciofluvial (outwash) deposits. Some soils are forming in recent deposits of stream alluvium and in accumulations of organic matter.

Soils that formed in glacial till have a wide range of characteristics because till is a heterogeneous mixture of rock and soil material. A firm fragipan substratum is common in the deeper soils, such as Pittstown, Bernardston, and Scriba soils. In places the till mantle is moderately deep or shallow over bedrock; Manlius, Nassau, or Glover soils may form in these places. The bedrock in Rensselaer County is variable and includes sandstone, slate, phyllite, shale, and limestone. The till deposits have a large amount of material derived from the local bedrock *(9)*.

As the glacial ice melted, enormous quantities of meltwater carried and sorted soil and rock debris. This outwash material was redeposited as layers of sand and gravel on outwash plains, terraces, kames, eskers, and deltas. These soils are commonly medium textured to coarse textured. Chenango and Hoosic soils are examples.

Many of the larger valleys at one time contained lakes where glacial meltwater was trapped. Most of the stone-free sediment deposited in the quiet lake waters was high in clay or silt. Rhinebeck, Hudson, and Raynham soils formed in these fine textured to medium textured deposits.

Overflowing streams regularly deposit fresh alluvial material on the flood plains. Soils forming in this material are typically loamy and show only weak profile development. Hamlin and Limerick soils are examples.

Soils that formed in organic deposits occupying low areas are identified as "muck." Carlisle and Palms soils formed in the well decomposed remains of trees and other plants. Loxley and Beseman soils formed in depressions in the colder parts of the county.

Topography

The shape of the land surface, its slope, and the relation of the surface to the water table have great influence on the formation of soils *(17)*.

Soils that formed in convex sloping areas, where little runoff accumulates or where runoff is moderate or rapid, generally are well drained and have a bright-colored, unmottled subsoil. Lime and other salts are generally leached to greater depths than in wetter, lowlying soils in the same general area. In more gently sloping areas where runoff is slower, the soils are wetter, as shown by mottling in the subsoil.

In level areas or slight depressions the water table is at or near the surface for long periods. The marked wetness causes development of a thick, dark surface layer that is high in organic matter and a strongly mottled or grayish subsoil.

Some soils are wet because they are in positions where water accumulates and is perched above an impervious layer in the soil. Permeability of the soil material, as well as the length, steepness, and

configuration of slopes, influences the kind of soil that forms.

Climate

Climate, particularly temperature and precipitation, is one of the most influential of the soil forming factors. It largely determines the kind of weathering processes that occur. It also affects kinds of plants and their growth and the leaching and translocation of weathered material.

Rensselaer County has a humid, temperate climate that tends to promote the development of moderately weathered, leached soils. More detailed information on the climate of this area is given in "General Nature of the County."

The average soil temperature is high in lowland areas and on south-facing slopes but cooler at high elevations of the plateau and the mountains. Temperature differences affect the growth of vegetation, and the differences in vegetation and temperature cause differences among soils.

Plant and Animal Life

All living organisms, including plants, animals, bacteria, and fungi, are important in soil formation. Vegetation is generally responsible for the amount of organic matter and nutrients in the soil and for the color and structure of the surface layer. Animals such as earthworms and other burrowers help to keep the soil porous and permeable to air and water. Their waste products cause aggregation of soil particles and improve structure. Bacteria and fungi decompose vegetation, thus releasing nutrients for plant use.

Rensselaer County was originally under a forest of northern hardwoods and pine in varying proportions. Hardwoods retard the leaching of nutrients. They take up large quantities of nutrients and return much of this material each year as leaf litter. In contrast, pines and other conifers do not use large amounts of nutrients. Therefore more nutrients are lost in soils that support coniferous plants than in soils that support hardwoods.

The shallow root zone in many of the soils allows frequent windthrow of trees, which mixes the soil material.

Man also influences soils by clearing trees, cultivating the land, adding fertilizer, mixing some soil horizons by plowing, and accelerating erosion.

Time

Time is a passive but important factor in soil formation. In geological terms, the material in which the soils of Rensselaer County formed are relatively young. Most of the material was deposited during the last period of glaciation, which ended about 10,000 to 15,000 years ago. The soils, however, have not all reached the same stage of profile development. The degree of profile development of a soil reflects not only its age but also the influence of the other soil-forming factors.

Elmridge and Hudson soils appear younger than Bath and Chenango soils because of the difference in parent material. All have welldefined horizons. An immature soil has not had enough time for distinct horizons to form. Teel and Limerick soils, for example, are forming in alluvium on flood plains. They are immature because the flood plains receive periodic deposits of fresh alluvium.

Processes of Soil Formation

The soilforming factors cause certain processes that differentiate characteristic layers, or horizons, in the soil. These horizons are visible in a soil profile. A profile is a vertical cut that extends from the surface downward into material that is little altered by soil forming processes. Most mature soils contain three major horizons: A, B, and C.

Several processes are involved in the formation of soil horizons: accumulation of organic matter, leaching of soluble salts and minerals, translocation of silicate clay minerals, reduction and transfer of iron, and formation of a compact layer in the subsoil.

Organic matter accumulates as plant residues decompose. This process darkens the surface layer to form an A1 horizon. The surface layer of most soils in Rensselaer County is about 3.5 percent organic matter.

For the development of a distinct subsoil (B horizon), some of the lime and other soluble salts must be leached away so that other processes such as translocation of clay minerals can take place. Leaching is affected by the kinds of salts originally present, the rate and depth of water movement, and the texture of the soil.

One of the most important processes of soil horizon development in some of the soils in this county is the translocation of silicate clay minerals. The content of clay minerals in a soil is determined by the parent material, but clay content varies from one horizon to another. Clay particles are moved (eluviated) downward from the A horizon and redeposited (illuviated) in the B horizon as clay films on ped faces, as linings along pores and root channels, and as coatings on some coarse fragments. In Hudson soils, for example, the clay content is higher in the B horizon than in the A horizon because of translocation. In some soils an A2 horizon has been formed by considerable eluviation of clay minerals to the B horizon.

Reduction and transfer of iron compounds occur mainly in the wetter, more poorly drained soils. This process is known as gleying. In poorly drained and very poorly drained soils, such as Alden and Madalin soils, the grayish subsoil indicates the reduction and transfer of iron in solution. In moderately well drained to somewhat poorly drained soils, yellowish brown and reddish brown mottles indicate the segregation of iron compounds. Oxidation takes place along with some reduction in these soils.

Several well drained and moderately well drained soils in the county have strong brown, yellowish brown, or reddish brown horizons in the subsoil. These colors are caused mainly by thin coatings of iron oxides on sand and silt particles. A brightly colored subsoil with iron oxide coatings normally has developed subangular blocky structure but contains little or no clay translocated from the overlying horizons. Chenango and Bernardston soils are examples.

Many soils in this county have a distinct fragipan in the subsoil. A fragipan is a very dense layer that is very firm and brittle when moist and very hard when dry. Scriba, Pittstown, and Buckland soils are among those that have a fragipan. The development of fragipans is not fully understood. The swelling and shrinking that takes place in alternating wet and dry periods may account for the dense packing of soil particles, the small pore space, and the large prisms or gross polygonal pattern of vertical cracks evident in most fragipans *(7).* Clay, silica, and oxides of aluminum—the most likely cementing agents—cause brittleness and hardness.

References

(1) American Association of State Highway (and Transportation) Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vol., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 248769. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Broughton, J. G., et al. 1962. The geology of New York State. N.Y. State Mus. and Sci. Serv. Geol. Surv., Map and Chart Ser. 5. 42 pp., illus., map.

(4) Capital District Regional Planning Commission and United States Department of Agriculture, Soil Conservation Service. 1974. Generalized soils report, capital district region. Tech. Rep. 2001, 103 pp., maps.

(5) Cline, M. G., and R. L. Marshall. 1976. Soils of New York landscapes. Cornell Univ. Coop. Ext. Serv. Inf. Bull. 119, 61 pp., illus., map.

(6) Cushman, R. V. 1950. The ground water resources of Rensselaer County, New York. N.Y. Water Power and Control Comm. and U.S. Geol. Surv. Ground Water Branch, Bull. GW-21, 56 pp., illus., maps.

(7) Grossman, R. B., and F. J. Carlisle. 1969. Fragipan soils of the eastern United States. Adv. Agron. 21: 237279, illus.

(8) LaFleur, R. G. 1965. Glacial geology of the Troy, N.Y., quadrangle. N.Y. State Educ. Dep., SUNY, Map and Chart Ser. 7, 22 pp., illus., map.

(9) Potter, Donald B. 1972. Stratigraphy and structure of the Hoosick Falls area, New York-Vermont, east-central Taconics. N.Y. State Educ. Dep., SUNY, Map and Chart Ser. 19, 71 pp., illus., maps.

(10) Rensselaer County Health Department. 1961. Water resources in Rensselaer County, an environmental health study. N.Y. State Dep. Health, 275 pp., illus., maps.

(11) United States Department of Agriculture. 1937. Soil survey of Rensselaer County, New York. Ser. 1932, No. 15, 70 pp., map.

(12) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus.

(13) United States Department of Agriculture. 1967. New York State inventory of soil and water conservation needs. 287 pp., illus.

(14) United States Department of Agriculture. 1970. The timber resources of New York. For. Serv. Resour. Bull. NE-20, 193 pp., illus.

(15) United States Department of Agriculture. 1975. Soil taxonomy; A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dept. Agric. Handb. 436, 754 pp., illus.

(16) United States Department of Commerce, Bureau of the Census. 1977. 1974 census of agriculture, New York state and county data. Vol. 1, part 32, pp. 229-234.

(17) Wolfanger, L. A. 1941. Land form types, a method of quantitative and graphic analysis and classification. Mich. State Coll. Agric. Exp. Stn. Tech. Bull. 175, 24 pp., illus.

Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

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

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

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

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

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40inch profile or to a limiting layer is expressed as

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	More than 5.2

Basal till. Compact glacial till deposited beneath the ice.

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

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

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

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

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

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

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

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

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

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

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other watercontrol measures on a complex slope is difficult.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. Tillage that does not invert the soil and that retains a protective mulch of crop residue on the surface throughout the year. Forms of conservation tillage include *notill, strip tillage,* and *stubble mulching.*

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—
Loose. Noncoherent when dry or moist; does not hold together in a mass.
Friable. When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm. When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic. When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a wire" when rolled between thumb and forefinger.
Sticky. When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard. When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft. When dry, breaks into powder or individual grains under very slight pressure.
Cemented. Hard; little affected by moistening.

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

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

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms. The Lco horizon is a limnic layer that contains many fecal pellets.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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

Deferred grazing. Postponing grazing or resting grazingland for a prescribed period.

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

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

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained. Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained. Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained. Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained. Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained. Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained. Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water

is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained. Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

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

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the 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 (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Fast intake (in tables). The rapid movement of water into the soil.

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

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

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

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

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

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 37.5 centimeters) long.

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

Foot slope. The inclined surface at the base of a hill.

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

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

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

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

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

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as

protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

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

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

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

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

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

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

O horizon. An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

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

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

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

C horizon. The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Lake plain (geology). An area of low relief that formed at the bottom of a glacial lake.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

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

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

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

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

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

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

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

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

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

Open space. A relatively undeveloped green or wooded area provided mainly within an urban area to minimize feelings of congested living.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

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

Oxbow. An abandoned meander of a river or stream formed by the cutting off of the neck between adjacent bends of the river or stream.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

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

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

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

Percolation. The downward movement of water through the soil.

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

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

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

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

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

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

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

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

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

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

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

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

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

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

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

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sandsize particles.

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

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

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

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

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

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

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

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

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

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

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 (in tables). The slow movement of water into the soil.

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

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

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

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

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

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

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

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

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

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

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

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

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

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

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

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

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

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

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

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

Till plain. An extensive flat to undulating area underlain by glacial till.

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

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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

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

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

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

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

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grain particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-78 at Albany, New York]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F		In	In	In		In
January----	30.1	11.7	20.9	55	-18	8	2.32	1.36	3.16	7	15.8
February---	33.2	14.5	23.8	56	-17	0	2.33	1.41	3.14	6	15.0
March------	42.3	24.4	33.4	71	2	33	3.00	1.99	3.92	7	12.5
April------	57.6	35.5	46.6	85	17	223	2.90	2.08	3.66	7	2.3
May--------	69.4	45.2	57.3	90	28	536	3.36	1.88	4.66	8	.1
June-------	78.5	55.2	66.8	96	37	804	3.28	1.86	4.52	7	.0
July-------	83.1	59.5	71.4	97	45	973	3.02	1.53	4.31	7	.0
August-----	80.7	57.5	69.1	94	42	902	3.25	1.95	4.40	7	.0
September--	72.7	49.6	61.2	91	30	636	3.24	1.69	4.59	6	.0
October----	61.7	39.4	50.6	82	20	335	2.93	1.25	4.35	6	.1
November---	47.8	30.8	39.3	71	10	83	3.02	1.63	4.24	7	4.8
December---	34.6	18.4	26.5	60	-10	16	3.14	1.71	4.39	7	16.4
Total----	57.6	36.8	47.2	97	-21	4,549	35.79	30.03	41.31	82	67.0

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-78 at Albany, New York]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 24	May 6	May 24
2 years in 10 later than--	April 19	May 1	May 19
5 years in 10 later than--	April 10	April 23	May 8
First freezing temperature in fall:			
1 year in 10 earlier than--	October 10	October 3	September 19
2 years in 10 earlier than--	October 16	October 7	September 22
5 years in 10 earlier than--	October 27	October 16	September 29

TABLE 3.--GROWING SEASON

[Data were recorded in the period 1951-78 at Albany, New York]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	177	158	126
8 years in 10	185	164	132
5 years in 10	200	175	144
2 years in 10	214	187	156
1 year in 10	222	193	162

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AlB	Albrights silt loam, 3 to 8 percent slopes	1,558	0.4
AlC	Albrights silt loam, 8 to 15 percent slopes	2,823	0.7
AlD	Albrights silt loam, 15 to 25 percent slopes	1,018	0.2
AmC	Albrights very stony silt loam, 3 to 15 percent slopes	1,976	0.5
AmD	Albrights very stony silt loam, 15 to 40 percent slopes	2,570	0.6
AnA	Alden silt loam, 0 to 3 percent slopes	5,175	1.2
AoA	Alden very stony silt loam, 0 to 3 percent slopes	295	*
BeB	Bernardston gravelly silt loam, 3 to 8 percent slopes	2,471	0.6
BeC	Bernardston gravelly silt loam, 8 to 15 percent slopes	9,816	2.3
BeD	Bernardston gravelly silt loam, 15 to 25 percent slopes	24,059	5.7
BeE	Bernardston gravelly silt loam, 25 to 35 percent slopes	4,654	1.1
BfC	Bernardston very stony silt loam, 3 to 15 percent slopes	5,680	1.3
BfD	Bernardston very stony silt loam, 15 to 40 percent slopes	6,348	1.5
BnB	Bernardston-Nassau complex, undulating	7,836	1.8
BnC	Bernardston-Nassau complex, rolling	14,215	3.3
BnD	Bernardston-Nassau complex, hilly	8,304	2.0
BoD	Bernardston-Pittstown association, very stony, moderately steep	2,929	0.7
BrA	Brayton very stony silt loam, nearly level	10,479	2.5
BuC	Buckland very stony loam, sloping	38,328	9.0
BuD	Buckland very stony loam, moderately steep	25,318	5.9
BuF	Buckland very stony loam, very steep	635	0.1
CaA	Carlisle muck, 0 to 1 percent slopes	867	0.2
CbA	Castile gravelly silt loam, 0 to 5 percent slopes	1,448	0.3
ChA	Chenango very gravelly loam, 0 to 3 percent slopes	639	0.2
ChB	Chenango very gravelly loam, 3 to 8 percent slopes	2,424	0.6
CkB	Chenango gravelly loam, fan, 3 to 8 percent slopes	1,602	0.4
Du	Dumps, landfill	219	*
ElB	Elmridge very fine sandy loam, 3 to 8 percent slopes	1,892	0.4
FlA	Fluvaquents-Udifluvents complex, 0 to 3 percent slopes	8,680	2.0
FrA	Fredon silt loam, 0 to 4 percent slopes	1,716	0.4
GlC	Glover very stony loam, very rocky, sloping	7,221	1.7
GlD	Glover very stony loam, very rocky, moderately steep	17,245	4.1
GmF	Glover-Rock outcrop complex, very steep	2,530	0.6
HaA	Hamlin silt loam, 0 to 3 percent slopes	2,435	0.6
HbA	Haven silt loam, 0 to 3 percent slopes	1,224	0.3
HbB	Haven silt loam, 3 to 8 percent slopes	590	0.1
HoA	Hoosic gravelly sandy loam, 0 to 3 percent slopes	2,626	0.6
HoB	Hoosic gravelly sandy loam, 3 to 8 percent slopes	10,067	2.4
HoC	Hoosic gravelly sandy loam, rolling	7,927	1.9
HoD	Hoosic gravelly sandy loam, hilly	6,323	1.5
HoE	Hoosic gravelly sandy loam, steep	2,061	0.5
HuB	Hudson silt loam, 3 to 8 percent slopes	2,794	0.7
HuC	Hudson silt loam, 8 to 15 percent slopes	1,283	0.3
HuD	Hudson silt loam, hilly	2,139	0.5
HuE	Hudson silt loam, steep	9,434	2.2
LmA	Limerick silt loam, 0 to 3 percent slopes	4,946	1.2
LoA	Loxley and Beseman mucks, 0 to 1 percent slopes	1,305	0.3
MaC	Macomber-Taconic slaty silt loams, very rocky, sloping	1,223	0.3
MaE	Macomber-Taconic slaty silt loams, very rocky, steep	11,419	2.7
MaF	Macomber-Taconic slaty silt loams, very rocky, very steep	6,421	1.5
MbA	Madalin silt loam, 0 to 3 percent slopes	1,148	0.3
NaB	Nassau-Manlius complex, undulating	5,837	1.4
NaC	Nassau-Manlius complex, rolling	14,834	3.5
NrC	Nassau-Rock outcrop complex, rolling	5,977	1.4
NrD	Nassau-Rock outcrop complex, hilly	20,728	4.9
ObA	Occum Variant-Barbour Variant complex, 0 to 3 percent slopes	1,307	0.3
PaA	Palms muck, 0 to 1 percent slopes	510	0.1
Pg	Pits, gravel	1,065	0.3
PtB	Pittstown gravelly silt loam, 3 to 8 percent slopes	12,108	2.8
PtC	Pittstown gravelly silt loam, 8 to 15 percent slopes	22,736	5.3
PuC	Pittstown-Bernardston association, very stony, sloping	2,019	0.5
RaA	Raynham silt loam, 0 to 5 percent slopes	1,310	0.3
RhA	Rhinebeck silt loam, 0 to 3 percent slopes	3,012	0.7
RhB	Rhinebeck silt loam, 3 to 8 percent slopes	3,103	0.7
RkA	Riverhead fine sandy loam, 0 to 3 percent slopes	314	0.1
RkB	Riverhead fine sandy loam, 3 to 8 percent slopes	2,199	0.5
RkC	Riverhead fine sandy loam, rolling	1,322	0.3
Sa	Saprists and Aquents, ponded	1,221	0.3
ScA	Scio very fine sandy loam, 0 to 3 percent slopes	430	0.1
ScB	Scio very fine sandy loam, 3 to 8 percent slopes	1,160	0.3
SrA	Scriba silt loam, 0 to 3 percent slopes	543	0.1
SrB	Scriba silt loam, 3 to 8 percent slopes	8,462	2.0

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
StB	Scriba very stony silt loam, 3 to 8 percent slopes	1,249	0.3
SvB	Scriba-Pittstown association, very stony, gently sloping	307	0.1
SwA	Shaker very fine sandy loam, sandy substratum, 0 to 4 percent slopes	853	0.2
TeA	Teel silt loam, 0 to 3 percent slopes	2,287	0.5
Ud	Udorthents, loamy	1,013	0.2
Ue	Udorthents, sandy	1,510	0.4
UnA	Unadilla silt loam, 0 to 3 percent slopes	250	*
UnB	Unadilla silt loam, 3 to 8 percent slopes	565	0.1
UnC	Unadilla silt loam, 8 to 15 percent slopes	295	*
Ur	Urban land	1,696	0.4
WnA	Windsor loamy sand, 0 to 3 percent slopes	788	0.2
WnB	Windsor loamy sand, 3 to 8 percent slopes	2,152	0.5
WnC	Windsor loamy sand, 8 to 15 percent slopes	631	0.1
WnE	Windsor loamy sand, 25 to 35 percent slopes	1,949	0.5
	Water areas	1,523	0.4
	Total	425,600	100.0

*Less than 0.1 percent

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn silage	Corn	Oats	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Pasture
	Ton	Bu	Bu	Ton	Ton	Ton	AUM*
AlB---------- Albrights	21	105	70	4.0	4.0	4.0	7.5
AlC---------- Albrights	18	90	65	3.5	4.0	4.0	7.5
AlD---------- Albrights	14	70	55	3.0	3.5	3.5	6.5
AmC---------- Albrights	---	---	---	---	---	---	2.5
AmD---------- Albrights	35	47	59	71	83	95	2.0
AnA---------- Alden	14	70	---	---	3.0	3.0	6.0
AoA---------- Alden	---	---	---	---	---	---	1.5
BeB---------- Bernardston	24	120	85	5.0	3.0	4.0	7.5
BeC---------- Bernardston	22	110	75	4.5	3.0	4.0	7.5
BeD---------- Bernardston	16	80	---	4.0	3.0	3.5	6.5
BeE, BfC, BfD---------- Bernardston	---	---	---	---	---	---	2.0
BnB---------- Bernardston-Nassau	17	85	70	4.0	3.0	3.0	6.0
BnC---------- Bernardston-Nassau	15	75	65	4.0	3.0	3.0	6.0
BnD---------- Bernardston-Nassau	12	60	---	3.0	---	3.0	6.0
BoD**:							
Bernardston----------	---	---	---	---	---	---	2.0
Pittstown----------	---	---	---	---	---	---	2.0
BrA---------- Brayton	---	---	---	---	---	---	1.5
BuC---------- Buckland	---	---	---	---	---	---	2.5
BuD, BuF---------- Buckland	---	---	---	---	---	---	2.0
CaA. Carlisle							
CbA---------- Castile	24	120	90	5.0	4.0	4.5	8.5
ChA---------- Chenango	23	110	90	5.0	2.5	4.5	8.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Corn	Oats	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Pasture
	Ton	Bu	Bu	Ton	Ton	Ton	AUM*
ChB---- Chenango	23	110	90	5.0	2.5	4.5	8.5
CkB---- Chenango	23	110	90	5.0	3.0	4.5	8.5
Du**. Dumps							
ElB---- Elmridge	23	110	70	4.0	4.5	4.0	7.5
FlA---- Fluvaquents-Udifluvents	---	---	---	---	---	---	1.5
FrA---- Fredon	18	90	65	3.5	4.5	4.0	7.5
GlC, GlD---- Glover	---	---	---	---	---	---	2.0
GmF. Glover-Rock outcrop							
HaA---- Hamlin	30	150	100	7.0	4.0	4.5	8.5
HbA---- Haven	26	130	95	6.0	3.0	4.5	8.5
HbB---- Haven	26	130	95	6.0	3.0	4.5	8.5
HoA---- Hoosic	18	90	70	4.5	3.0	3.5	6.5
HoB---- Hoosic	18	90	70	4.5	3.0	3.5	6.5
HoC---- Hoosic	16	80	65	4.0	3.0	3.5	6.5
HoD---- Hoosic	14	70	---	4.0	2.5	3.0	6.0
HoE---- Hoosic	---	---	---	---	---	---	3.0
HuB---- Hudson	24	120	70	5.0	4.5	4.5	8.5
HuC---- Hudson	22	110	65	4.5	4.5	4.5	8.5
HuD---- Hudson	---	---	---	4.5	4.0	4.0	7.5
HuE---- Hudson	---	---	---	---	---	---	4.0
LmA---- Limerick	16	80	---	---	4.0	3.0	6.0
LoA. Loxley and Beseman							
MaC---- Macomber-Taconic	---	---	---	---	---	---	3.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Corn	Oats	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Pasture
	Ton	Bu	Bu	Ton	Ton	Ton	AUM*
MaE---------- Macomber-Taconic	---	---	---	---	---	---	2.5
MaF. Macomber-Taconic							
MbA---------- Madalin	12	60	---	---	4.0	3.5	6.5
NaB---------- Nassau-Manlius	12	60	60	3.5	3.0	3.0	6.0
NaC---------- Nassau-Manlius	10	50	50	3.0	2.5	2.5	5.0
NrC---------- Nassau-Rock outcrop	---	---	---	---	---	---	2.0
NrD---------- Nassau-Rock outcrop	---	---	---	---	---	---	2.0
ObA---------- Occum variant-Barbour variant	24	120	90	5.0	4.0	4.5	7.0
PaA. Palms							
Pg**. Pits							
PtB---------- Pittstown	22	110	75	4.5	4.0	4.0	7.5
PtC---------- Pittstown	20	100	70	4.5	4.0	4.0	7.5
PuC**: Pittstown----------	18	90	65	3.5	4.0	4.0	2.5
Bernardston----------	---	---	---	---	---	---	2.5
RaA---------- Raynham	18	90	65	2.5	4.5	4.5	8.5
RhA---------- Rhinebeck	19	95	60	3.5	3.5	4.0	7.5
RhB---------- Rhinebeck	20	100	65	4.0	4.0	4.5	8.5
RkA, RkB---------- Riverhead	20	100	70	5.0	3.0	3.5	6.5
RkC---------- Riverhead	17	85	65	4.5	3.0	3.5	6.5
Sa. Saprists and Aquents							
ScA---------- Scio	26	130	90	5.0	3.0	4.5	8.5
ScB---------- Scio	26	130	90	5.0	3.0	4.5	8.5
SrA---------- Scriba	16	80	60	3.0	3.5	3.0	6.0

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Corn	Oats	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Pasture
	Ton	Bu	Bu	Ton	Ton	Ton	AUM*
SrB---------- Scriba	17	85	65	3.5	4.0	3.5	6.5
StB---------- Scriba	---	---	---	---	---	---	2.0
SvB**: Scriba----------	17	85	65	3.0	3.5	3.5	2.0
Pittstown----------	---	---	---	---	---	---	2.5
SwA---------- Shaker	18	90	70	2.5	4.5	4.0	7.5
TeA---------- Teel	26	130	90	5.0	4.0	4.5	8.5
Ud**, Ue**. Udorthents							
UnA---------- Unadilla	28	140	100	7.0	3.5	4.5	8.5
UnB---------- Unadilla	28	140	100	7.0	3.5	4.5	8.5
UnC---------- Unadilla	26	130	90	6.0	3.0	4.5	8.5
Ur**. Urban land							
WnA, WnB---------- Windsor	16	80	65	4.5	2.5	3.0	6.0
WnC---------- Windsor	12	60	60	3.0	2.5	3.0	6.0
WnE---------- Windsor	---	---	---	---	---	---	2.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	3,909	---	---	---	---
II	56,317	19,173	19,472	17,672	---
III	88,193	66,254	18,999	2,940	---
IV	69,954	56,677	12,646	631	---
V	8,680	---	8,680	---	---
VI	78,573	16,149	---	62,424	---
VII	111,726	---	1,304	110,422	---
VIII	1,221	---	1,221	---	---

TABLE 7.--CAPABILITY CLASSIFICATION OF THE SOILS

[Absence of an entry means that the soils or land type was not classified]

Map symbol	Soil name	Capability subclass
AlB	Albrights silt loam, 3 to 8 percent slopes	IIe
AlC	Albrights silt loam, 8 to 15 percent slopes	IIIe
AlD	Albrights silt loam, 15 to 25 percent slopes	IVe
AmC	Albrights very stony silt loam, 3 to 15 percent slopes	VIs
AmD	Albrights very stony silt loam, 15 to 40 percent slopes	VIIs
AnA	Alden silt loam, 0 to 3 percent slopes	IVw
AoA	Alden very stony silt loam, 0 to 3 percent slopes	VIIs
BeB	Bernardston gravelly silt loam, 3 to 8 percent slopes	IIe
BeC	Bernardston gravelly silt loam, 8 to 15 percent slopes	IIIe
BeD	Bernardston gravelly silt loam, 15 to 25 percent slopes	IVe
BeE	Bernardston gravelly silt loam, 25 to 35 percent slopes	VIe
BfC	Bernardston very stony silt loam, 3 to 15 percent slopes	VIs
BfD	Bernardston very stony silt loam, 15 to 40 percent slopes	VIIs
BnB	Bernardston-Nassau complex, undulating	IIe
BnC	Bernardston-Nassau complex, rolling	IIIe
BnD	Bernardston-Nassau complex, hilly	IVe
BoD	Bernardston-Pittstown association, very stony, moderately steep	VIIs
BrA	Brayton very stony silt loam, nearly level	VIIs
BuC	Buckland very stony loam, sloping	VIs
BuD	Buckland very stony loam, moderately steep	VIIs
BuF	Buckland very stony loam, very steep	VIIs
CaA	Carlisle muck, 0 to 1 percent slopes	IVw
CbA	Castile gravelly silt loam, 0 to 5 percent slopes	IIw
ChA	Chenango very gravelly loam, 0 to 3 percent slopes	IIs
ChB	Chenango very gravelly loam, 3 to 8 percent slopes	IIs
CkB	Chenango gravelly loam, fan, 3 to 8 percent slopes	IIs
Du	Dumps, landfill	---
ElB	Elmridge very fine sandy loam, 3 to 8 percent slopes	IIw
FlA	Fluvaquents-Udifluvents complex, 0 to 3 percent slopes	Vw
FrA	Fredon silt loam, 0 to 4 percent slopes	IIIw
GlC	Glover very stony loam, very rocky, sloping	VIs
GlD	Glover very stony loam, very rocky, moderately steep	VIIs
GmF	Glover-Rock outcrop complex, very steep	VIIs
HaA	Hamlin silt loam, 0 to 3 percent slopes	I
HbA	Haven silt loam, 0 to 3 percent slopes	I
HbB	Haven silt loam, 3 to 8 percent slopes	IIe
HoA	Hoosic gravelly sandy loam, 0 to 3 percent slopes	IIs
HoB	Hoosic gravelly sandy loam, 3 to 8 percent slopes	IIs
HoC	Hoosic gravelly sandy loam, rolling	IIIe
HoD	Hoosic gravelly sandy loam, hilly	IVe
HoE	Hoosic gravelly sandy loam, steep	VIe
HuB	Hudson silt loam, 3 to 8 percent slopes	IIe
HuC	Hudson silt loam, 8 to 15 percent slopes	IIIe
HuD	Hudson silt loam, hilly	IVe
HuE	Hudson silt loam, steep	VIe
LmA	Limerick silt loam, 0 to 3 percent slopes	IVw
LoA	Loxley and Beseman mucks, 0 to 1 percent slopes	VIIw
MaC	Macomber-Taconic slaty silt loams, very rocky, sloping	VIs
MaE	Macomber-Taconic slaty silt loams, very rocky, steep	VIIs
MaF	Macomber-Taconic slaty silt loams, very rocky, very steep	VIIs
MbA	Madalin silt loam, 0 to 3 percent slopes	IVw
NaB	Nassau-Manlius complex, undulating	IIIe
NaC	Nassau-Manlius complex, rolling	IVe
NrC	Nassau-Rock outcrop complex, rolling	VIs
NrD	Nassau-Rock outcrop complex, hilly	VIIs
ObA	Occum Variant-Barbour Variant complex, 0 to 3 percent slopes	IIw
PaA	Palms muck, 0 to 1 percent slopes	IVw
Pg	Pits, gravel	---
PtB	Pittstown gravelly silt loam, 3 to 8 percent slopes	IIw
PtC	Pittstown gravelly silt loam, 8 to 15 percent slopes	IIIe
PuC	Pittstown-Bernardston association, very stony sloping	VIs
RaA	Raynham silt loam, 0 to 5 percent slopes	IIIw
RhA	Rhinebeck silt loam, 0 to 3 percent slopes	IIIw
RhB	Rhinebeck silt loam, 3 to 8 percent slopes	IIIw
RkA	Riverhead fine sandy loam, 0 to 3 percent slopes	IIs
RkB	Riverhead fine sandy loam, 3 to 8 percent slopes	IIe
RkC	Riverhead fine sandy loam, rolling	IIIe
Sa	Saprists and Aquents, ponded	VIIIw
ScA	Scio very fine sandy loam, 0 to 3 percent slopes	IIw
ScB	Scio very fine sandy loam, 3 to 8 percent slopes	IIe

TABLE 7.--CAPABILITY CLASSIFICATION OF THE SOILS--Continued

Map symbol	Soil name	Capability subclass
SrA	Scriba silt loam, 0 to 3 percent slopes	IIIw
SrB	Scriba silt loam, 3 to 8 percent slopes	IIIw
StB	Shaker very fine sandy loam, sandy substratum, 0 to 4 percent slopes	VIIs
SvB	Scriba very stony silt loam, 3 to 8 percent slopes	VIIs
SwA	Scriba-Pittstown association, very stony, gently sloping	IIIw
TeA	Teel silt loam, 0 to 3 percent slopes	IIw
Ud	Udorthents, loamy	---
Ue	Udorthents, sandy	---
UnA	Unadilla silt loam, 0 to 3 percent slopes	I
UnB	Unadilla silt loam, 3 to 8 percent slopes	IIe
UnC	Unadilla silt loam, 8 to 15 percent slopes	IIIe
Ur	Urban land	---
WnA	Windsor loamy sand, 0 to 3 percent slopes	IIIs
WnB	Windsor loamy sand, 3 to 8 percent slopes	IIIs
WnC	Windsor loamy sand, 8 to 15 percent slopes	IVs
WnE	Windsor loamy sand, 25 to 35 percent slopes	VIIs

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
AlB---------- Albrights	3o	Slight	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine
						White ash----------	---	European larch, Norway
						Red maple----------	---	spruce, white spruce.
AlC---------- Albrights	3o	Slight	Slight	Slight	Slight	Northern red oak----	70	Red pine, eastern
						White ash----------	---	white pine, European
						Red maple----------	---	larch, Norway spruce,
								white spruce.
AlD---------- Albrights	3r	Moderate	Moderate	Slight	Slight	Northern red oak----	70	Eastern white pine,
						White ash----------	---	European larch, Norway
						Red maple----------	---	spruce, white spruce.
AmC---------- Albrights	3o	Slight	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine,
						Yellow-poplar-------	75	European larch, Norway
						White ash----------	---	spruce, white spruce.
						Red maple----------	---	
AmD---------- Albrights	3r	Moderate	Moderate	Slight	Slight	Northern red oak----	70	Eastern white pine,
						Yellow-poplar-------	75	European
						White ash----------	---	larch, Norway spruce,
						Red maple----------	---	white spruce.
AnA, AoA---------- Alden	5w	Slight	Severe	Severe	Severe	Red maple----------	50	White spruce, northern white-cedar.
BeB, BeC---------- Bernardston	4o	Slight	Slight	Slight	Slight	Northern red oak----	55	Eastern white pine,
						Eastern white pine--	65	Norway spruce, white
						Sugar maple---------	65	spruce, Scotch pine,
						Eastern hemlock-----	65	European larch.
BeD, BeE---------- Bernardston	4r	Slight	Moderate	Slight	Slight	Northern red oak----	55	Eastern white pine,
						Eastern white pine--	65	Norway spruce,
						Sugar maple---------	65	white spruce, Scotch,
						Eastern hemlock-----	65	pine, European larch.
BfC---------- Bernardston	4o	Slight	Slight	Slight	Slight	Northern red oak----	55	Eastern white pine,
						Eastern white pine--	65	Norway spruce, white
						Sugar maple---------	65	spruce, Scotch pine,
						Eastern hemlock-----	65	European larch.
BfD---------- Bernardston	4r	Slight	Moderate	Slight	Slight	Northern red oak----	55	Eastern white pine,
						Eastern white pine--	65	Norway spruce, white
						Sugar maple---------	65	spruce, Scotch pine,
						Eastern hemlock-----	65	European larch.
BnB*, BnC*: Bernardston-------	4o	Slight	Slight	Slight	Slight	Northern red oak----	55	Eastern white pine,
						Eastern white pine--	65	Norway spruce,
						Sugar maple---------	65	balsam fir, white
						Eastern hemlock-----	65	spruce, Scotch pine,
								European larch.
Nassau----------	5d	Slight	Slight	Severe	Moderate	Sugar maple---------	50	Eastern white pine,
						Northern red oak----	50	red pine, European
						Eastern white pine--	55	larch, Scotch pine.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
BnD*:								
Bernardston	4r	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple Eastern hemlock	55 65 65 65	Eastern white pine, Norway spruce, balsam fir, white spruce, Scotch pine, European larch.
Nassau	5d	Slight	Moderate	Severe	Moderate	Sugar maple Northern red oak Eastern white pine	50 50 55	Eastern white pine, red pine, European larch, Scotch pine.
BoD*:								
Bernardston	4r	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple Eastern hemlock	55 65 65 65	Eastern white pine, Norway spruce, white spruce, Scotch pine, European larch.
Pittstown	3r	Slight	Moderate	Slight	Slight	Northern red oak Sugar maple Eastern white pine Eastern hemlock	72 66 80 75	Eastern white pine, Norway spruce, white spruce, European larch.
BrA Brayton	4w	Slight	Severe	Severe	Severe	Northern red oak Sugar maple Eastern white pine White spruce Balsam fir Red maple Eastern hemlock Red spruce Birch	60 60 67 56 56 65 --- 47 ---	Eastern white pine, white spruce, Norway spruce.
BuC Buckland	3o	Slight	Slight	Slight	Slight	Eastern white pine Sugar maple White spruce Balsam fir American beech	71 57 64 62 --	Eastern white pine, Norway spruce, white spruce, European larch.
BuD Buckland	3r	Slight	Moderate	Slight	Slight	Eastern white pine Sugar maple White spruce Balsam fir American beech Birch	71 57 64 62 -- --	Eastern white pine, Norway spruce, red pine, white spruce, European larch.
BuF Buckland	3r	Moderate	Severe	Slight	Slight	Eastern white pine Sugar maple White spruce Balsam fir American beech Birch	71 57 64 62 --- 	Eastern white pine, Norway spruce, red pine, white spruce, European larch.
CaA Carlisle	5w	Slight	Severe	Severe	Severe	Red maple White ash Hemlock	51 51 45	
CbA Castile	3o	Slight	Slight	Slight	Slight	Sugar maple Northern red oak Black cherry	63 70 70	Eastern white pine, Norway spruce, white spruce, European larch.
ChA, ChB Chenango	2o	Slight	Slight	Slight	Slight	Sugar maple Northern red oak	70 80	Eastern white pine, red pine, European larch.
CkB Chenango	2o	Slight	Slight	Slight	Slight	Sugar maple Northern red oak	70 80	Eastern white pine, Norway spruce, white spruce, European larch.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
ElB---------- Elmridge	3o	Slight	Slight	Slight	Slight	Eastern white pine--	75	Eastern white pine, European larch, white spruce, Norway spruce, European larch.
						Northern red oak----	70	
						Shagbark hickory----	60	
FrA---------- Fredon	4w	Slight	Severe	Severe	Severe	Northern red oak----	60	Yellow-poplar, eastern white pine, white spruce, Norway spruce, European larch.
						Eastern white pine--	70	
						Red maple----------	70	
GlC---------- Glover	4d	Slight	Slight	Severe	Moderate	White spruce--------	57	Eastern white pine, white spruce.
						Red spruce----------	44	
						Sugar maple---------	61	
						Yellow birch--------	59	
						Paper birch---------	64	
						Red maple----------	65	
						American beech------	58	
						Eastern white pine--	65	
GlD---------- Glover	4d	Slight	Moderate	Severe	Moderate	White spruce--------	57	Eastern white pine, white spruce.
						Red spruce----------	44	
						Sugar maple---------	61	
						Yellow birch--------	59	
						Paper birch---------	64	
						Red maple----------	65	
						American beech------	58	
						Eastern white pine--	65	
GmF*: Glover----------	4d	Moderate	Severe	Severe	Moderate	White spruce--------	57	Eastern white pine, white spruce.
						Red spruce----------	44	
						Sugar maple---------	61	
						Yellow birch--------	59	
						Paper birch---------	64	
						Red maple----------	65	
						American beech------	58	
						Eastern white pine--	65	
Rock outcrop.								
HaA---------- Hamlin	2o	Slight	Slight	Slight	Slight	Northern red oak----	80	Eastern white pine, black locust, Norway spruce, black walnut, European larch.
						Sugar maple---------	70	
HbA, HbB---------- Haven	3o	Slight	Slight	Slight	Slight	Eastern white pine--	75	Eastern white pine, red pine, Norway spruce, European larch.
						Northern red oak----	55	
						Sugar maple---------	65	
						Red pine-----------	75	
HoA, HoB, HoC------ Hoosic	3o	Slight	Slight	Slight	Slight	Sugar maple---------	65	Eastern white pine, red pine, European larch.
						Northern red oak----	75	
HoD, HoE---------- Hoosic	3r	Slight	Moderate	Slight	Slight	Sugar maple---------	65	Eastern white pine, red pine, European larch.
						Northern red oak----	75	
HuB---------- Hudson	2o	Slight	Slight	Slight	Slight	Northern red oak----	80	Eastern white pine, yellow-poplar, black walnut.
						Sugar maple---------	70	
						Eastern white pine--	85	
						White ash----------	85	
HuC---------- Hudson	2r	Moderate	Slight	Slight	Slight	Northern red oak----	80	Eastern white pine, yellow-poplar, black walnut.
						Sugar maple---------	70	
						Eastern white pine--	85	
						White ash----------	85	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
HuD, HuE---------- Hudson	2r	Severe	Moderate	Slight	Slight	Northern red oak---- Sugar maple--------- Eastern white pine-- White ash----------	80 70 85 85	Eastern white pine, yellow-poplar, black walnut.
LmA---------- Limerick	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----------	65 ---	Eastern white pine, white spruce, northern white-cedar.
LoA*: Loxley----------	5w	Slight	Severe	Severe	Severe	Balsam fir---------- Black spruce-------- Tamarack----------	39 15 35	
Beseman----------	4w	Slight	Severe	Severe	Slight	Black spruce-------- Tamarack----------	23 34	Black spruce.
MaC*: Macomber----------	3o	Slight	Slight	Slight	Slight	Sugar maple--------- White spruce-------- Balsam fir---------- Red spruce---------- American beech------ Paper birch--------- Eastern hemlock----- White oak---------- Northern red oak----	65 65 65 55 --- 70 --- 70 70	Eastern white pine, red pine, white spruce, balsam fir, Norway spruce, European larch.
Taconic----------	5d	Slight	Slight	Severe	Moderate	Sugar maple--------- White spruce-------- Balsam fir---------- Red spruce---------- American beech------ Paper birch--------- Eastern hemlock----- White oak---------- Northern red oak----	50 50 50 40 --- 53 --- 50 50	Eastern white pine, red pine, white spruce, balsam fir, Norway spruce, European larch.
MaE*: Macomber----------	3r	Slight	Moderate	Slight	Slight	Sugar maple--------- White spruce-------- Balsam fir---------- Red spruce---------- American beech------ Paper birch--------- Eastern hemlock----- White oak---------- Northern red oak----	65 65 65 55 --- 70 --- 70 70	Eastern white pine, red pine, white spruce, balsam fir, Norway spruce, European larch.
Taconic----------	5d	Slight	Moderate	Severe	Moderate	Sugar maple--------- White spruce-------- Balsam fir---------- Red spruce---------- American beech------ Paper birch--------- Eastern hemlock----- White oak---------- Northern red oak----	50 50 50 40 --- 53 --- 50 50	Eastern white pine, red pine, white spruce, balsam fir, Norway spruce, European larch.
MaF*: Macomber----------	3r	Severe	Severe	Slight	Slight	Sugar maple--------- White spruce-------- Balsam fir---------- Red spruce---------- American beech------ Paper birch--------- Eastern hemlock----- White oak---------- Northern red oak----	65 65 65 55 --- 70 --- 70 70	Eastern white pine, red pine, white spruce, balsam fir, Norway spruce, European larch.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
MaF*:								
Taconic	5d	Moderate	Severe	Severe	Moderate	Sugar maple	50	Eastern white pine, red pine, white spruce, balsam fir, Norway spruce, European larch.
						White spruce	50	
						Balsam fir	50	
						Red spruce	40	
						American beech	---	
						Paper birch	53	
						Eastern hemlock	---	
						White oak	50	
						Northern red oak	50	
MbA	5w	Slight	Severe	Severe	Severe	Red maple	50	Eastern white pine, northern white-cedar, white spruce.
Madalin						White ash	50	
NaB*, NaC*:								
Nassau	5d	Slight	Slight	Severe	Moderate	Sugar maple	50	Eastern white pine, red pine, European larch.
						Northern red oak	50	
						Eastern white pine	55	
Manlius	3o	Slight	Slight	Slight	Slight	Northern red oak	70	Eastern white pine, red pine, Norway spruce, European larch.
						Black cherry	70	
						Sugar maple	70	
NrC*:								
Nassau	5d	Slight	Slight	Severe	Moderate	Sugar maple	50	Eastern white pine, red pine, European larch.
						Northern red oak	50	
						Eastern white pine	55	
Rock outcrop.								
NrD*:								
Nassau	5d	Slight	Moderate	Severe	Moderate	Sugar maple	50	Eastern white pine, red pine, European larch.
						Northern red oak	50	
						Eastern white pine	55	
Rock outcrop.								
ObA*:								
Occum variant	2o	Slight	Slight	Slight	Slight	Eastern white pine	75	Eastern white pine, white spruce.
						Red pine	75	
						Red maple	60	
						Yellow birch	60	
Barbour variant	2o	Slight	Slight	Slight	Slight	Sugar maple	70	Eastern white pine, Norway spruce, black walnut.
PaA	4w	Slight	Severe	Severe	Severe	Red maple	51	
Palms						White ash	51	
						Hemlock	45	
						Silver maple	76	
PtB, PtC	3o	Slight	Slight	Slight	Slight	Northern red oak	72	Eastern white pine, Norway spruce, white spruce, European larch.
Pittstown						Sugar maple	66	
						Eastern white pine	80	
						Eastern hemlock	75	
PuC*:								
Pittstown	3o	Slight	Slight	Slight	Slight	Northern red oak	72	Eastern white pine, Norway spruce, white spruce, European larch.
						Sugar maple	66	
						Eastern white pine	80	
						Eastern hemlock	75	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
PuC*:								
Bernardston	4o	Slight	Slight	Slight	Slight	Northern red oak	55	Eastern white pine, Norway spruce, white spruce, European larch, Scotch pine.
						Eastern white pine	65	
						Sugar maple	65	
						Eastern hemlock	65	
RaA	4w	Slight	Severe	Severe	Severe	Eastern white pine	65	Eastern white pine, white spruce, northern white-cedar, European larch.
Raynham						White spruce	55	
						Red spruce	45	
						Red maple	---	
RhA, RhB	3w	Slight	Moderate	Slight	Slight	Sugar maple	65	Eastern white pine, Norway spruce, European larch, white spruce.
Rhinebeck						Northern red oak	70	
						Eastern white pine	75	
						Red maple	70	
RkA, RkB, RkC	3o	Slight	Slight	Slight	Slight	Sugar maple	63	Eastern white pine, Norway spruce, white spruce, European larch, red pine.
Riverhead						Northern red oak	70	
						Black cherry	70	
						Eastern white pine	75	
ScA, ScB	2o	Slight	Slight	Slight	Slight	Northern red oak	75	European larch, eastern white pine, Norway spruce, white spruce.
Scio						White ash	85	
						Sugar maple	70	
						Black cherry	80	
						Eastern hemlock	70	
						Eastern white pine	85	
SrA, SrB, StB	3w	Slight	Moderate	Moderate	Moderate	Northern red oak	75	Eastern white pine, white spruce, Norway spruce.
Scriba						Sugar maple	60	
						Black cherry	65	
SvB*:								
Scriba	3w	Slight	Moderate	Moderate	Moderate	Northern red oak	75	Eastern white pine, white spruce, Norway spruce.
						Sugar maple	60	
						Black cherry	65	
Pittstown	3o	Slight	Slight	Slight	Slight	Northern red oak	72	Eastern white pine, Norway spruce, white spruce, European larch.
						Sugar maple	66	
						Eastern white pine	80	
						Eastern hemlock	75	
SwA	5w	Slight	Severe	Severe	Severe	Eastern white pine	57	Eastern white pine, white spruce, northern white-cedar.
Shaker						Sugar maple	55	
						Red maple	55	
						Hemlock	---	
TeA	2o	Slight	Slight	Slight	Slight	Sugar maple	70	Eastern white pine, Norway spruce, black walnut, European larch.
Teel						Eastern white pine	85	
						White ash	85	
UnA, UnB	2o	Slight	Slight	Slight	Slight	Sugar maple	70	Eastern white pine, Norway spruce, black cherry, European larch, red pine, white spruce.
Unadilla						Eastern white pine	85	
						Northern red oak	80	
						Black cherry	80	
						White ash	95	
UnC	2r	Moderate	Slight	Slight	Slight	Sugar maple	70	Eastern white pine, Norway spruce, European larch, red pine, white spruce, black walnut.
Unadilla						Eastern white pine	85	
						Northern red oak	80	
						Black cherry	80	
						White ash	95	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
WnA, WnB, WnC------ Windsor	5s	Slight	Slight	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Sugar maple---------	57 52 61 55	Eastern white pine, red pine.
WnE---------- Windsor	5s	Slight	Moderate	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Sugar maple---------	57 52 61 55	Eastern white pine, red pine.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WOOD VOLUME YIELDS BY SPECIES AND SITE INDICES

Site index	Northern hardwoods	Northern red oak	Eastern white pine
	Ft^3/acre	Ft^3/acre	Ft^3/acre
50	32	34	81
55	35	38	92
60	38	43	102
65	40	47	114
70	43	52	127
75	47	57	137
80	50	62	147

TABLE 10.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AlB---------- Albrights	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AlC---------- Albrights	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness.	Moderate: wetness, slope.
AlD---------- Albrights	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: wetness, slope.	Severe: slope.
AmC---------- Albrights	Moderate: wetness, slope, large stones.	Moderate: wetness, slope, large stones.	Severe: large stones, slope.	Moderate: wetness.	Moderate: wetness, slope, large stones.
AmD---------- Albrights	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: wetness, slope.	Severe: slope, large stones.
AnA---------- Alden	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus, erodes easily.	Severe: wetness.
AoA---------- Alden	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: large stones, excess humus, wetness.	Severe: wetness, excess humus, erodes easily.	Severe: wetness.
BeB, BeC---------- Bernardston	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: small stones, slope.	Slight----------	Moderate: small stones, slope.
BeD---------- Bernardston	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BeE---------- Bernardston	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
BfC---------- Bernardston	Moderate: large stones, percs slowly.	Moderate: large stones, percs slowly.	Severe: large stones, slope, small stones.	Slight----------	Moderate: large stones, slope.
BfD---------- Bernardston	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope, large stones.
BnB*: Bernardston----------	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: small stones.
Nassau----------	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Slight----------	Severe: small stones, thin layer.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BnC*:					
Bernardston	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
Nassau	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones.	Slight	Severe: small stones, thin layer.
BnD*:					
Bernardston	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Nassau	Severe: slope, depth to rock, small stones.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope, thin layer.
BoD*:					
Bernardston	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope, large stones.
Pittstown	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Moderate: slope.	Severe: slope, large stones.
BrA Brayton	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: large stones, wetness.	Severe: wetness.	Severe: wetness, large stones.
BuC Buckland	Moderate: slope, large stones, wetness.	Moderate: slope, large stones, wetness.	Severe: slope, large stones.	Moderate: wetness.	Moderate: slope, large stones, wetness.
BuD, BuF Buckland	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope.	Severe: slope.
CaA Carlisle	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.
CbA Castile	Moderate: small stones, wetness.	Moderate: small stones, wetness.	Severe: small stones.	Moderate: wetness.	Moderate: small stones, wetness.
ChA, ChB Chenango	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
CkB Chenango	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
Du*. Dumps					
ElB Elmridge	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
FlA*: Fluvaquents. Udifluvents.					
FrA---- Fredon	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GlC---- Glover	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Slight----	Severe: thin layer, large stones.
GlD---- Glover	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.	Moderate: slope.	Severe: slope, thin layer, large stones.
GmF*: Glover----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.	Severe: slope.	Severe: slope, thin layer.
Rock outcrop.					
HaA---- Hamlin	Severe: flooding.	Slight----	Moderate: flooding.	Slight----	Moderate: flooding.
HbA---- Haven	Slight----	Slight----	Moderate: small stones.	Slight----	Slight.
HbB---- Haven	Slight----	Slight----	Moderate: slope, small stones.	Moderate: erodes easily.	Slight.
HoA, HoB---- Hoosic	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----	Moderate: droughty, small stones.
HoC---- Hoosic	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----	Moderate: droughty, small stones.
HoD---- Hoosic	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
HoE---- Hoosic	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
HuB---- Hudson	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
HuC---- Hudson	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
HuD---- Hudson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
HuE---- Hudson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LmA---------- Limerick	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: flooding, wetness.
LoA*:					
Loxley----------	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Beseman----------	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.
MaC*:					
Macomber----------	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, droughty, slope.
Taconic----------	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight----------	Severe: droughty, thin layer.
MaE*, MaF*:					
Macomber----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Taconic----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, thin layer.
MbA---------- Madalin	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
NaB*:					
Nassau----------	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight----------	Severe: thin layer.
Manlius----------	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: small stones, droughty.
NaC*:					
Nassau----------	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones.	Slight----------	Severe: thin layer.
Manlius----------	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: small stones, slope.	Slight----------	Moderate: small stones, droughty.
NrC*:					
Nassau----------	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones.	Slight----------	Severe: thin layer.
Rock outcrop.					
NrD*:					
Nassau----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones.	Severe----------	Severe: slope, thin layer.
Rock outcrop.					

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ObA*: Occum variant	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.
Barbour variant	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
PaA Palms	Severe: ponding, flooding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
Pg*. Pits					
PtB Pittstown	Moderate: small stones, wetness.	Moderate: small stones, wetness.	Severe: small stones.	Moderate: wetness.	Moderate: small stones, wetness.
PtC Pittstown	Moderate: slope, small stones, wetness.	Moderate: slope, small stones, wetness.	Severe: slope, small stones.	Moderate: wetness.	Moderate: slope, small stones, wetness.
PuC*: Pittstown	Moderate: slope, large stones, wetness.	Moderate: slope, large stones, wetness.	Severe: slope, large stones, small stones.	Moderate: wetness.	Moderate: slope, large stones.
Bernardston	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: large stones, slope, small stones.	Slight	Moderate: large stones, slope.
RaA Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
RhA, RhB Rhinebeck	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
RkA Riverhead	Slight	Slight	Slight	Slight	Slight.
RkB Riverhead	Slight	Slight	Moderate: slope.	Slight	Slight.
RkC Riverhead	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Sa*: Saprists. Aquents.					
ScA Scio	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
ScB Scio	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: erodes easily, wetness.	Moderate: wetness.
SrA, SrB Scriba	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
StB---------- Scriba	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: large stones, small stones, wetness.	Severe: wetness.	Severe: wetness, large stones.
SvB*: Scriba----------	Severe: wetness, large stones.	Severe: wetness.	Severe: large stones, small stones, wetness.	Severe: wetness.	Severe: wetness, large stones.
Pittstown----------	Moderate: large stones, wetness.	Moderate: large stones, wetness.	Severe: large stones, small stones.	Moderate: wetness.	Moderate: large stones.
SwA---------- Shaker	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
TeA---------- Teel	Severe: flooding.	Moderate: wetness.	Moderate: flooding, wetness.	Moderate: wetness.	Moderate: wetness, flooding.
Ud*, Ue*. Udorthents					
UnA---------- Unadilla	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
UnB---------- Unadilla	Slight----------	Slight----------	Moderate: slope.	Moderate: erodes easily.	Slight.
UnC---------- Unadilla	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Ur*. Urban land					
WnA---------- Windsor	Slight----------	Slight----------	Slight----------	Slight----------	Moderate: droughty.
WnB---------- Windsor	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
WnC---------- Windsor	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, droughty.
WnE---------- Windsor	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AlB---- Albrights	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AlC---- Albrights	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AlD---- Albrights	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
AmC, AmD---- Albrights	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
AnA, AoA---- Alden	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BeB---- Bernardston	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BeC---- Bernardston	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BeD---- Bernardston	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BeE---- Bernardston	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BfC, BfD---- Bernardston	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BnB*: Bernardston-------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Nassau----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BnC*: Bernardston-------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Nassau----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BnD*: Bernardston-------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Nassau----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BoD*: Bernardston-------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Pittstown---------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BrA---- Brayton	Very poor.	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BuC, BuD, BuF------ Buckland	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
CaA---------- Carlisle	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
CbA---------- Castile	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ChA, ChB---------- Chenango	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CkB---------- Chenango	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Du*. Dumps										
ElB---------- Elmridge	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FlA*: Fluvaquents.										
Udifluvents.										
FrA---------- Fredon	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
GlC, GlD---------- Glover	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
GmF*: Glover----------	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
HaA---------- Hamlin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HbA---------- Haven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HbB---------- Haven	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HoA, HoB, HoC, HoD- Hoosic	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
HoE---------- Hoosic	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
HuB---------- Hudson	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HuC---------- Hudson	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HuD---------- Hudson	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HuE---------- Hudson	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
LmA---------- Limerick	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
LoA*:										
Loxley----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Beseman----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Very poor.	Good.
MaC*:										
Macomber----------	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Taconic----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MaE*:										
Macomber----------	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Taconic----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MaF*:										
Macomber----------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
Taconic----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MbA---------- Madalin	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
NaB*:										
Nassau----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Manlius----------	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
NaC*:										
Nassau----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Manlius----------	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
NrC*:										
Nassau----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
NrD*:										
Nassau----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
ObA*:										
Occum variant-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Barbour variant---	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
PaA---------- Palms	Good	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
Pg*. Pits										
PtB---------- Pittstown	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
PtC---------- Pittstown	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
PuC*:										
Pittstown----------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Bernardston-------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
RaA---------- Raynham	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
RhA---------- Rhinebeck	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
RhB---------- Rhinebeck	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RkA---------- Riverhead	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RkB, RkC---------- Riverhead	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Sa*:										
Saprists.										
Aquents.										
ScA---------- Scio	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ScB---------- Scio	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SrA---------- Scriba	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
SrB---------- Scriba	Fair	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
StB---------- Scriba	Very poor.	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
SvB*:										
Scriba----------	Very poor.	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
Pittstown----------	Very poor.	Poor	Good	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
SwA---------- Shaker	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
TeA---------- Teel	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ud*, Ue*. Udorthents										
UnA, UnB---------- Unadilla	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
UnC---------- Unadilla	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ur*. Urban land										
WnA, WnB, WnC------ Windsor	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
WnE---------- Windsor	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AlB---------- Albrights	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: wetness.
AlC---------- Albrights	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, frost action, slope.	Moderate: wetness, slope.
AlD---------- Albrights	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
AmC---------- Albrights	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, frost action, slope.	Moderate: wetness, slope, large stones.
AmD---------- Albrights	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
AnA, AoA---------- Alden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
BeB---------- Bernardston	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: small stones.
BeC---------- Bernardston	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: small stones, slope.
BeD, BeE---------- Bernardston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BfC---------- Bernardston	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: large stones, slope.
BfD---------- Bernardston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BnB*:						
Bernardston------	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: small stones.
Nassau----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, thin layer.
BnC*:						
Bernardston------	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: small stones, slope.
Nassau----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: small stones, thin layer.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BnD*: Bernardston------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Nassau----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: small stones, slope, thin layer.
BoD*: Bernardston------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pittstown--------	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.
BrA---------- Brayton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
BuC---------- Buckland	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: slope.	Moderate: frost action, wetness.	Moderate: slope, large stones.
BuD, BuF---------- Buckland	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.
CaA---------- Carlisle	Severe: excess humus, ponding.	Severe: ponding, low strength, flooding.	Severe: ponding, low strength, flooding.	Severe: ponding, low strength, flooding.	Severe: low strength, ponding, flooding.	Severe: excess humus, ponding, flooding.
CbA---------- Castile	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: small stones, wetness.
ChA---------- Chenango	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Moderate: small stones.
ChB---------- Chenango	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Moderate: small stones, droughty.
CkB---------- Chenango	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Moderate: small stones, droughty.
Du*. Dumps						
ElB---------- Elmridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness.
FlA*: Fluvaquents. Udifluvents.						
FrA---------- Fredon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
GlC---------- Glover	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
GlD---------- Glover	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, thin layer.
GmF*: Glover----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, thin layer.
Rock outcrop.						
HaA---------- Hamlin	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
HbA---------- Haven	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
HbB---------- Haven	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
HoA---------- Hoosic	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, small stones.
HoB---------- Hoosic	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty, small stones.
HoC---------- Hoosic	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, small stones.
HoD, HoE---------- Hoosic	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HuB---------- Hudson	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: frost action, low strength.	Moderate: wetness.
HuC---------- Hudson	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: frost action, low strength.	Moderate: wetness, slope.
HuD, HuE---------- Hudson	Severe: slope, wetness.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope, frost action, low strength.	Severe: slope.
LmA---------- Limerick	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, frost action.	Severe: flooding, wetness.
LoA*: Loxley----------	Severe: excess humus, excess humus.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action.	Severe: ponding, ponding,
Beseman----------	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, low strength.	Severe: ponding, low strength.	Severe: excess humus, ponding.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MaC*:						
Macomber	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: small stones, droughty, slope.
Taconic	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: droughty, thin layer.
MaE*, MaF*:						
Macomber	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Taconic	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, thin layer.
MbA--- Madalin	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength, frost action.	Severe: wetness.
NaB*:						
Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, thin layer.
Manlius	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Moderate: small stones, droughty.
NaC*:						
Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: small stones, thin layer.
Manlius	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, frost action.	Moderate: small stones, droughty.
NrC*:						
Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: small stones, thin layer.
Rock outcrop.						
NrD*:						
Nassau	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: small stones, slope, thin layer.
Rock outcrop.						
ObA*:						
Occum variant	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
Barbour variant	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
PaA---------- Palms	Severe: excess humus, ponding.	Severe: ponding, low strength, flooding.	Severe: ponding, low strength, flooding.	Severe: ponding, flooding, low strength.	Severe: ponding, flooding, frost action.	Severe: ponding, flooding, excess humus.
Pg*. Pits						
PtB---------- Pittstown	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action, wetness.	Moderate: small stones, wetness.
PtC---------- Pittstown	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Moderate: slope, frost action, wetness.	Moderate: slope, small stones, wetness.
PuC*: Pittstown--------	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Moderate: slope, frost action, wetness.	Moderate: slope, large stones, wetness.
Bernardston------	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: large stones, slope.
RaA---------- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
RhA, RhB---------- Rhinebeck	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action, wetness.	Severe: wetness.
RkA---------- Riverhead	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
RkB---------- Riverhead	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
RkC---------- Riverhead	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Sa*: Saprists.						
Aquents.						
ScA---------- Scio	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
ScB---------- Scio	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
SrA, SrB, StB----- Scriba	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SvB*: Scriba	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, droughty.
Pittstown	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action, wetness.	Moderate: large stones, wetness.
SwA Shaker	Severe: wetness, too clayey, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action, low strength.	Severe: wetness.
TeA Teel	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: frost action, flooding.	Moderate: wetness, flooding.
Ud*, Ue*. Udorthents						
UnA Unadilla	Severe: cutbanks cave.	Slight	Slight	Slight	Severe: frost action.	Slight.
UnB Unadilla	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Severe: frost action.	Slight.
UnC Unadilla	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: frost action.	Moderate: slope.
Ur*. Urban land						
WnA Windsor	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
WnB Windsor	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
WnC Windsor	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
WnE Windsor	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AlB---- Albrights	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
AlC---- Albrights	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
AlD---- Albrights	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Poor: slope.
AmC---- Albrights	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: small stones, wetness.
AmD---- Albrights	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Poor: slope.
AnA, AoA---- Alden	Severe: wetness, percs slowly.	Slight----	Severe: wetness.	Severe: wetness.	Poor: wetness.
BeB---- Bernardston	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
BeC---- Bernardston	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
BeD, BeE---- Bernardston	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
BfC---- Bernardston	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
BfD---- Bernardston	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
BnB*: Bernardston----	Severe: percs slowly.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
Nassau----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
BnC*: Bernardston----	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BnC*: Nassau	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
BnD*: Bernardston	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Nassau	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: slope, area reclaim, small stones.
BoD*: Bernardston	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Pittstown	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Poor: slope.
BrA Brayton	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: seepage, wetness.	Poor: small stones, wetness.
BuC Buckland	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: slope, small stones, wetness.
BuD, BuF Buckland	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Poor: slope.
CaA Carlisle	Severe: flooding, ponding.	Severe: excess humus, seepage, flooding.	Severe: flooding, ponding, excess humus.	Severe: flooding, ponding, seepage.	Poor: ponding, excess humus.
CbA Castile	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.
ChA, ChB Chenango	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
CkB Chenango	Severe: poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
Du*. Dumps					
ElB Elmridge	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: thin layer.
FlA*: Fluvaquents.					

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
FlA*: Udifluvents.					
FrA---- Fredon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, wetness, small stones.
GlC---- Glover	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: thin layer, area reclaim.
GlD---- Glover	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: slope, thin layer, area reclaim.
GmF*: Glover----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					
HaA---- Hamlin	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
HbA, HbB---- Haven	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
HoA, HoB---- Hoosic	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
HoC---- Hoosic	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
HoD, HoE---- Hoosic	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: small stones, seepage, too sandy.
HuB---- Hudson	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
HuC---- Hudson	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
HuD, HuE---- Hudson	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: slope, too clayey, wetness.	Severe: slope.	Poor: slope, too clayey, hard to pack.
LmA---- Limerick	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LoA*: Loxley	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
Beseman	Severe: ponding, percs slowly.	Severe: wetness, ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, seepage.	Poor: ponding, excess humus.
MaC*: Macomber	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Taconic	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones.
MaE*, MaF*: Macomber	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Taconic	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
MbA Madalin	Severe: percs slowly, wetness.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.
NaB*: Nassau	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Manlius	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
NaC*: Nassau	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Manlius	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
NrC*: Nassau	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Rock outcrop.					

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
NrD*:					
Nassau	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: slope, area reclaim, small stones.
Rock outcrop.					
ObA*:					
Occum variant	Severe: flooding, wetness, poor filter.	Severe: seepage, wetness, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Barbour variant	Severe: flooding, poor filter, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
PaA Palms	Severe: flooding, subsides, ponding.	Severe: seepage, excess humus, ponding.	Severe: ponding, flooding, excess humus.	Severe: ponding, flooding, seepage.	Poor: ponding, excess humus.
Pg*. Pits					
PtB Pittstown	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
PtC Pittstown	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: slope, small stones.
PuC*:					
Pittstown	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: slope, small stones.
Bernardston	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
RaA Raynham	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
RhA Rhinebeck	Severe: percs slowly, wetness.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
RhB Rhinebeck	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
RkA, RkB Riverhead	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
RkC Riverhead	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Sa*: Saprists.					
Aquents.					
ScA, ScB---------- Scio	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Fair: wetness, thin layer.
SrA---------- Scriba	Severe: wetness, percs slowly.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
SrB, StB---------- Scriba	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
SvB*: Scriba----------	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
Pittstown----------	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
SwA---------- Shaker	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: wetness, seepage, too clayey.	Severe: wetness, seepage.	Poor: wetness, too clayey, hard to pack.
TeA---------- Teel	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Ud*, Ue*. Udorthents					
UnA, UnB---------- Unadilla	Slight----------	Severe: seepage.	Severe: seepage.	Slight----------	Fair: thin layer.
UnC---------- Unadilla	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Moderate: slope.	Fair: slope, thin layer.
Ur*. Urban land					
WnA, WnB---------- Windsor	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: too sandy, seepage.	Poor: too sandy, seepage.
WnC---------- Windsor	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: too sandy, seepage.	Poor: too sandy, seepage.
WnE---------- Windsor	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, too sandy, seepage.	Poor: slope, too sandy, seepage.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AlB, AlC---------- Albrights	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
AlD---------- Albrights	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
AmC---------- Albrights	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim.
AmD---------- Albrights	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
AnA, AoA---------- Alden	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones, area reclaim.
BeB, BeC---------- Bernardston	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BeD---------- Bernardston	Fair: low strength, wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
BeE---------- Bernardston	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
BfC---------- Bernardston	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
BfD---------- Bernardston	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
BnB*, BnC*: Bernardston----------	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Nassau----------	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
BnD*: Bernardston----------	Fair: low strength, wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BnD*: Nassau	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, area reclaim, small stones.
BoD*: Bernardston	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
Pittstown	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
BrA Brayton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, large stones, wetness.
BuC Buckland	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
BuD, BuF Buckland	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
CaA Carlisle	Poor: low strength, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: wetness, excess humus.
CbA Castile	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
ChA, ChB, CkB Chenango	Good	Probable	Probable	Poor: small stones, area reclaim.
Du*. Dumps				
ElB Elmridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
FlA*: Fluvaquents. Udifluvents.				
FrA Fredon	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
GlC Glover	Poor: thin layer, area reclaim.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: large stones, thin layer, area reclaim.
GlD Glover	Poor: thin layer, area reclaim.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, large stones, thin layer.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
GmF*:				
Glover	Poor: slope, thin layer, area reclaim.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, large stones, thin layer.
Rock outcrop.				
HaA Hamlin	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
HbA, HbB Haven	Good	Probable	Probable	Poor: too sandy, area reclaim.
HoA, HoB, HoC Hoosic	Good	Probable	Probable	Poor: small stones, area reclaim.
HoD Hoosic	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
HoE Hoosic	Poor: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
HuB, HuC Hudson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, too clayey.
HuD Hudson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, thin layer, too clayey.
HuE Hudson	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, thin layer, too clayey.
LmA Limerick	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
LoA*:				
Loxley	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Beseman	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
MaC*:				
Macomber	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Taconic	Poor: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
MaE*, MaF*:				
Macomber	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MaE*, MaF*: Taconic	Poor: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
MbA---- Madalin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
NaB*, NaC*: Nassau	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Manlius	Poor: area reclaim.	Improbable: small stones, excess fines.	Improbable: thin layer, excess fines.	Poor: small stones, area reclaim.
NrC*: Nassau	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Rock outcrop.				
NrD*: Nassau	Poor: slope, thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, area reclaim, small stones.
Rock outcrop.				
ObA*: Occum variant	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
Barbour variant	Good	Probable	Probable	Poor: small stones, area reclaim.
PaA---- Palms	Poor: wetness, low strength.	Improbable: excess humus, excess fines.	Improbable: excess humus, excess fines.	Poor: wetness, excess humus.
Pg*. Pits				
PtB, PtC---- Pittstown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
PuC*: Pittstown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Bernardston	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
RaA---- Raynham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
RhA, RhB---- Rhinebeck	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RkA, RkB, RkC--------- Riverhead	Good----------	Probable----------	Probable----------	Poor: small stones.
Sa*: Saprists. Aquents.				
ScA, ScB---------- Scio	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
SrA, SrB, StB--------- Scriba	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
SvB*: Scriba----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, wetness.
Pittstown----------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
SwA---------- Shaker	Poor: wetness, low strength.	Improbable: thin layer.	Improbable: excess fines.	Poor: wetness.
TeA---------- Teel	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ud*, Ue*. Udorthents				
UnA, UnB, UnC--------- Unadilla	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
Ur*. Urban land				
WnA, WnB, WnC--------- Windsor	Good----------	Probable----------	Improbable: excess fines.	Poor: too sandy.
WnE---------- Windsor	Poor: slope.	Probable----------	Improbable: excess fines.	Poor: slope, too sandy.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
AlB---------- Albrights	Moderate: slope.	Severe: piping.	Severe: no water.	Slope----------	Wetness, rooting depth.	Wetness, droughty, rooting depth.
AlC, AlD---------- Albrights	Severe: slope.	Severe: piping.	Severe: no water.	Slope----------	Slope, wetness, rooting depth.	Wetness, slope, droughty.
AmC, AmD---------- Albrights	Severe: slope.	Severe: piping.	Severe: no water.	Slope----------	Slope, large stones. wetness.	Wetness, slope, large stones.
AnA---------- Alden	Slight---------	Severe: piping, wetness.	Slight---------	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily, rooting depth.
AoA---------- Alden	Slight---------	Severe: piping, wetness.	Slight---------	Percs slowly, frost action.	Wetness, erodes easily.	Wetness, rooting depth, erodes easily.
BeB---------- Bernardston	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Rooting depth, percs slowly.	Rooting depth, percs slowly.
BeC, BeD, BeE----- Bernardston	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, rooting depth.	Slope, percs slowly, rooting depth.
BfC, BfD---------- Bernardston	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, percs slowly.	Large stones, slope, percs slowly.
BnB*: Bernardston------	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Rooting depth, percs slowly.	Rooting depth, percs slowly.
Nassau----------	Severe: depth to rock.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Large stones, depth to rock.	Large stones, droughty, depth to rock.
BnC*, BnD*: Bernardston------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, rooting depth.	Slope, percs slowly, rooting depth.
Nassau----------	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
BoD*: Bernardston------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, percs slowly.	Large stones, slope, percs slowly.
Pittstown--------	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, large stones, percs slowly.	Large stones, slope, rooting depth.
BrA---------- Brayton	Slight---------	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Large stones, wetness.	Large stones, wetness.
BuC, BuD, BuF----- Buckland	Severe: slope.	Severe: piping.	Severe: no water.	Slope----------	Slope, rooting depth, large stones, wetness.	Slope, large stones, rooting depth, wetness.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
CaA---------- Carlisle	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Subsides, flooding, frost action.	Wetness, soil blowing.	Wetness.
CbA---------- Castile	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Droughty.
ChA, ChB---------- Chenango	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy------	Droughty.
CkB---------- Chenango	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Deep to water	Too sandy------	Droughty.
Du*. Dumps						
ElB---------- Elmridge	Moderate: slope.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, percs slowly.
FlA*: Fluvaquents. Udifluvents.						
FrA---------- Fredon	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action---	Wetness, too sandy.	Wetness.
GlC, GlD---------- Glover	Severe: slope, depth to rock.	Severe: piping, thin layer.	Severe: no water.	Deep to water	Depth to rock, slope, large stones.	Slope, depth to rock, large stones.
GmF*: Glover---------- Rock outcrop.	Severe: slope, depth to rock.	Severe: piping, thin layer.	Severe: no water.	Deep to water	Depth to rock, slope, large stones.	Slope, depth to rock, large stones.
HaA---------- Hamlin	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Erodes easily	Erodes easily.
HbA, HbB---------- Haven	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Erodes easily, too sandy.	Erodes easily.
HoA, HoB---------- Hoosic	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy------	Droughty.
HoC, HoD, HoE----- Hoosic	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, too sandy.	Slope, droughty.
HuB---------- Hudson	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Percs slowly, erodes easily.
HuC, HuD, HuE----- Hudson	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, percs slowly, erodes easily.
LmA---------- Limerick	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness, erodes easily.	Wetness, erodes easily.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
LoA*:						
Loxley	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
Beseman	Severe: seepage.	Severe: excess humus, wetness.	Severe: slow refill.	Ponding, excess humus, frost action.	Ponding, soil blowing.	Wetness.
MaC*, MaE*, MaF*:						
Macomber	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Taconic	Severe: seepage, depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
MbA Madalin	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly, erodes easily.
NaB*:						
Nassau	Severe: depth to rock.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Large stones, depth to rock.	Large stones, droughty, depth to rock.
Manlius	Moderate: seepage, depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, depth to rock.	Droughty, large stones, depth to rock.
NaC*:						
Nassau	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
Manlius	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, droughty, large stones.
NrC*, NrD*:						
Nassau	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
Rock outcrop.						
ObA*:						
Occum variant	Severe: seepage.	Severe: piping, seepage.	Severe: cutbanks cave.	Flooding, cutbanks cave, frost action.	Wetness, too sandy.	Wetness.
Barbour variant	Severe: seepage.	Severe: piping, seepage.	Severe: cutbanks cave.	Deep to water	Too sandy	Favorable.
PaA Palms	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Flooding, ponding, subsides.	Ponding, soil blowing.	Wetness.
Pg*. Pits						
PtB Pittstown	Moderate: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Percs slowly, wetness.	Percs slowly, wetness, rooting depth.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
PtC---------- Pittstown	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, percs slowly, wetness.	Slope, percs slowly, rooting depth.
PuC*: Pittstown--------	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, large stones, percs slowly.	Large stones, slope, rooting depth.
Bernardston------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, percs slowly.	Large stones, slope, percs slowly.
RaA---------- Raynham	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
RhA---------- Rhinebeck	Slight---------	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
RhB---------- Rhinebeck	Moderate: slope.	Severe: wetness.	Severe: no water.	Slope, percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
RkA, RkB---------- Riverhead	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy------	Favorable.
RkC---------- Riverhead	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, too sandy.	Slope.
Sa*: Saprists. Aquents.						
ScA---------- Scio	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave, frost action.	Erodes easily, wetness.	Erodes easily.
ScB---------- Scio	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave, frost action.	Erodes easily, wetness.	Erodes easily.
SrA---------- Scriba	Slight---------	Severe: seepage, piping, wetness.	Severe: no water.	Percs slowly---	Wetness, rooting depth.	Wetness, droughty.
SrB, StB---------- Scriba	Moderate: slope.	Severe: seepage, piping, wetness.	Severe: no water.	Percs slowly, slope.	Wetness, rooting depth.	Wetness, droughty.
SvB*: Scriba----------	Moderate: slope.	Severe: seepage, piping, wetness.	Severe: no water.	Percs slowly, slope.	Wetness, rooting depth, large stones.	Wetness, droughty, large stones.
Pittstown--------	Moderate: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Large stones, percs slowly, wetness.	Large stones, rooting depth, wetness.
SwA---------- Shaker	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Percs slowly, frost action, cutbanks cave.	Wetness, percs slowly.	Wetness, percs slowly.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
TeA---------- Teel	Moderate: seepage.	Severe: piping.	Moderate: slow refill.	Flooding, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
Ud*, Ue*. Udorthents						
UnA---------- Unadilla	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
UnB---------- Unadilla	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
UnC---------- Unadilla	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Ur*. Urban land						
WnA---------- Windsor	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Cutbanks cave	Too sandy------	Droughty.
WnB---------- Windsor	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Slope, cutbanks cave.	Too sandy------	Droughty.
WnC, WnE---------- Windsor	Severe: slope, seepage.	Severe: seepage, piping.	Severe: no water.	Slope, cutbanks cave.	Slope, too sandy.	Slope, droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AlB, AlC, AlD---- Albrights	0-9	Silt loam--------	ML, CL	A-4	0-10	80-100	80-95	70-90	55-80	---	---
	9-19	Channery clay loam, gravelly silt loam, silty clay loam.	ML, CL, SM, SC	A-4, A-6	0-15	80-100	65-95	60-90	40-85	25-40	3-15
	19-60	Silt loam, gravelly silty clay loam, channery clay loam.	CL, ML, SC, SM-SC	A-4, A-2, A-6	0-15	65-100	45-95	40-90	25-80	20-40	3-15
AmC, AmD--------- Albrights	0-9	Very stony silt loam.	ML, CL	A-4, A-2	3-15	65-100	60-90	55-85	50-80	---	---
	9-19	Channery clay loam, gravelly silt loam, silty clay loam.	ML, CL, SM, SC	A-4, A-6	0-15	80-100	65-95	60-90	40-85	25-40	3-15
	19-60	Silt loam, gravelly silty clay loam, channery clay loam.	CL, ML, SC, SM-SC	A-4, A-2, A-6	0-15	65-100	55-95	40-90	25-80	20-40	3-15
AnA---------- Alden	0-7	Silt loam--------	ML, OL	A-7, A-5	0	80-100	75-100	65-95	55-85	40-50	5-15
	7-40	Silt loam, silty clay loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	80-100	75-100	65-95	55-85	20-35	5-15
	40-60	Gravelly loam, fine sandy loam, silty clay loam.	CL, GC, SC, CL-ML	A-2, A-4, A-6	0-5	60-95	50-90	45-90	30-85	20-35	5-15
AoA---------- Alden	0-7	Very stony silt loam.	ML, OL	A-7, A-5	3-10	80-100	75-100	65-95	55-85	40-50	5-15
	7-40	Silt loam, silty clay loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	80-100	75-100	65-95	55-85	20-35	5-15
	40-60	Gravelly loam, fine sandy loam, silty clay loam.	CL, GC, SC, CL-ML	A-2, A-4, A-6	0-5	60-95	50-90	45-90	30-85	20-35	5-15
BeB, BeC, BeD, BeE---------- Bernardston	0-8	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6, A-7	0-10	65-80	50-70	45-70	30-65	24-45	4-14
	8-30	Silt loam, loam, channery silt loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	30-60	Channery silt loam, loam, channery loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8
BfC, BfD--------- Bernardston	0-8	Very stony silt loam.	ML, CL-ML, SM, GM	A-2, A-4, A-6, A-7	10-20	60-90	45-85	40-85	30-75	24-45	4-14
	8-30	Silt loam, loam, channery silt loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	30-60	Channery silt loam, loam, channery loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BnB*, BnC*, BnD*: Bernardston-----	0-8	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6, A-7	0-10	65-80	50-70	45-70	30-65	24-45	4-14
	8-30	Silt loam, loam, channery silt loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	30-60	Channery silt loam, loam, channery loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8
Nassau----------	0-7	Very shaly silt loam.	GM, GM-GC	A-2, A-4, A-1	5-20	30-60	25-55	20-55	15-50	25-35	4-10
	7-15	Very shaly silt loam, very shaly loam.	GM, GM-GC	A-2, A-4, A-1	10-25	30-60	25-55	20-55	15-50	25-35	4-10
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
BoD*: Bernardston-----	0-8	Very stony silt loam.	ML, CL-ML, SM, GM	A-2, A-4, A-6, A-7	10-20	60-90	45-85	40-85	30-75	24-45	4-14
	8-30	Silt loam, loam, channery silt loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	30-60	Channery silt loam, loam, channery loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8
Pittstown-------	0-9	Very stony silt loam.	ML, SM, CL-ML, GM	A-2, A-4, A-6, A-7	10-20	65-90	60-85	50-85	30-75	25-45	4-15
	9-24	Silt loam, very fine sandy loam, channery loam.	ML, SM, CL-ML, GM	A-2, A-4	0-15	65-95	60-90	50-90	30-80	20-35	2-10
	24-60	Channery silt loam, channery very fine sandy loam, loam.	ML, SM, CL, GM	A-2, A-4	0-15	60-95	55-85	45-85	30-75	20-30	2-10
BrA---------- Brayton	0-11	Very stony silt loam.	GM, GM, ML	A-4, A-1, A-2	5-20	55-80	50-75	30-75	15-70	<15	NP-4
	11-19	Gravelly fine sandy loam, gravelly sandy loam, loam.	GM, ML, SM	A-2, A-4, A-1	0-15	55-95	50-90	30-90	15-80	<15	NP-4
	19-60	Gravelly fine sandy loam, very gravelly sandy loam, loam.	GM, SM, ML, GM-GC	A-2, A-4, A-1	0-15	45-95	40-90	25-85	10-70	<15	NP-4
BuC, BuD, BuF---- Buckland	0-2	Very stony loam	ML, SM	A-4	2-10	80-100	75-90	60-90	35-75	<47	NP-8
	2-22	Loam, silt loam, gravelly fine sandy loam.	ML, SM	A-4	5-20	85-100	75-90	60-90	35-70	<37	NP-6
	22-60	Loam, silt loam, gravelly fine sandy loam.	ML, SM, GM	A-4	5-20	65-100	55-85	45-85	35-70	<27	NP-6
CaA---------- Carlisle	0-62	Sapric material	PT	A-8	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CbA---------- Castile	0-10	Gravelly silt loam.	ML, GM, SM, CL-ML	A-2, A-4	0-5	55-85	50-75	40-75	30-65	<30	NP-10
	10-32	Very gravelly loam, very gravelly sandy loam, gravelly silt loam.	GM, SW-SM, ML, GM-GC	A-1, A-2, A-4	2-10	40-75	35-70	15-65	5-60	<30	NP-10
	32-60	Very gravelly sand, very gravelly loam, very gravelly loamy sand.	GW, GP, GW-GM, SW-SM	A-1, A-2, A-4	5-10	30-85	25-70	10-45	0-40	---	NP
ChA, ChB---------- Chenango	0-7	Very gravelly loam.	ML, SM, GM	A-2, A-4, A-1	5-15	40-60	35-55	25-55	15-50	<35	NP-10
	7-43	Gravelly silt loam, gravelly fine sandy loam, very gravelly silt loam.	ML, GM, SM	A-2, A-4, A-1	5-10	35-80	30-75	25-75	15-65	<40	NP-10
	43-78	Very gravelly loamy coarse sand, very gravelly sand, gravelly loamy fine sand.	GW, GM, SM, SP	A-1	5-10	25-65	20-60	10-50	1-20	---	NP
CkB---------- Chenango	0-10	Gravelly loam----	ML, GM, SM	A-2, A-4, A-1	5-15	55-85	55-80	35-80	15-70	<35	NP-10
	10-24	Channery silt loam, channery loam, very gravelly fine sandy loam.	ML, GM, SM, GP-GM	A-2, A-4, A-1	5-20	25-75	20-70	15-70	10-65	<40	NP-10
	24-60	Very gravelly loamy coarse sand, very gravelly sand, gravelly loamy fine sand.	GW, GM, SM, SP	A-1	10-20	15-60	10-55	5-45	0-20	---	NP
Du*. Dumps											
ElB---------- Elmridge	0-9	Very fine sandy loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	9-36	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	36-60	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	75-95	35-65	15-45
FlA*: Fluvaquents.											
Udifluvents.											
FrA---------- Fredon	0-8	Silt loam--------	ML, CL, SC, SM	A-2, A-4, A-1	0-2	80-100	75-95	30-90	15-70	20-30	NP-10
	8-23	Loam, silt loam, gravelly sandy loam.	SM, GC, ML, CL	A-2, A-4, A-1	0-2	60-100	55-95	30-85	15-70	20-30	NP-10
	23-60	Stratified very gravelly sand to loamy fine sand.	GP, GM, GW, GW-GM	A-1, A-2	0-5	30-90	25-85	10-60	0-35	---	NP

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
GlC, GlD---------	0-2	Very stony loam	ML	A-4	5-25	85-95	80-95	70-95	50-85	<40	NP-10
Glover	2-18	Loam, silt loam, channery loam.	ML, SM	A-4	5-30	75-95	70-95	60-95	45-85	<40	NP-10
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GmF*:											
Glover----------	0-2	Very stony loam	ML	A-4	5-25	85-95	80-95	70-95	50-85	<40	NP-10
	2-18	Loam, silt loam, channery loam.	ML, SM	A-4	5-30	75-95	70-95	60-95	45-85	<40	NP-10
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
HaA---------------	0-9	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	95-100	90-100	60-90	15-35	2-15
Hamlin	9-34	Silt loam, very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	95-100	90-100	60-90	15-35	2-15
	34-60	Silt loam, very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	95-100	90-100	60-90	15-35	2-15
HbA, HbB---------	0-10	Silt loam--------	ML, SM	A-4	0	80-100	75-100	65-100	40-90	<25	NP-4
Haven	10-30	Gravelly loam, silt loam, gravelly sandy loam.	ML, SM	A-4, A-2, A-1	0	60-100	55-95	40-95	20-85	<25	NP-4
	30-60	Stratified loamy fine sand to very gravelly sand.	SP, SW, GP, SM	A-1, A-3, A-2	0-20	30-90	25-85	10-60	1-25	<10	NP
HoA, HoB, HoC, HoD, HoE--------	0-9	Gravelly sandy loam.	GM, SM, ML	A-1, A-2, A-4	5-10	55-80	50-70	30-70	15-60	30-45	2-10
Hoosic	9-23	Gravelly sandy loam, very gravelly sandy loam, gravelly loam.	GM, SM, GP-GM, SP-SM	A-1, A-2, A-4	5-10	40-75	35-65	20-60	10-45	20-30	2-8
	23-60	Very gravelly sand, very gravelly loamy sand.	GM, GP, SP, SM	A-1	10-15	35-65	30-50	15-40	2-20	---	NP
HuB, HuC, HuD, HuE-------------	0-8	Silt loam--------	ML, CL-ML, CL	A-4, A-6, A-7	0	95-100	95-100	85-100	65-95	25-48	5-19
Hudson	8-16	Silty clay, silty clay loam.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
	16-28	Silty clay, silty clay loam.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
	28-60	Silty clay, silt loam, clay.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	60-100	35-65	15-35
LmA---------------	0-8	Silt loam--------	ML	A-4	0	100	100	95-100	80-95	---	NP
Limerick	8-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	80-95	---	NP
LoA*:											
Loxley----------	0-60	Sapric material	PT	A-8	---	---	---	---	---	---	---
Beseman---------	0-38	Sapric material	PT	A-8	0	---	---	---	---	---	---
	38-60	Loam, sandy loam	CL, ML, SM, SC	A-2, A-4, A-6	0-2	75-100	65-100	40-95	25-75	15-30	NP-12

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MaC*, MaE*, MaF*:											
Macomber--------	0-3	Slaty silt loam	GM, SM, ML, CL-ML	A-2, A-4, A-6	0-15	55-80	50-75	40-75	30-70	15-35	3-15
	3-23	Very slaty silt loam, very slaty loam.	GM, GM-GC, GC	A-1, A-2, A-4	5-15	30-55	25-50	20-50	15-45	15-30	3-15
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Taconic---------	0-5	Slaty silt loam	GM, SM, ML, CL-ML	A-2, A-4, A-6	0-15	55-80	50-75	40-75	30-70	15-35	3-15
	5-14	Very slaty silt loam, very slaty loam.	GM, GC, SM, SC	A-1, A-2, A-4	5-15	30-60	25-55	20-55	15-50	15-30	3-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MbA---------- Madalin	0-7	Silt loam--------	ML, MH, OL, OH	A-6, A-7	0	95-100	95-100	85-100	65-100	35-65	10-25
	7-39	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	95-100	95-100	85-100	70-100	38-65	20-35
	39-60	Silty clay, clay, silty clay loam.	CL, CH	A-6, A-7	0	75-100	70-100	65-100	60-100	35-60	15-35
NaB*, NaC*:											
Nassau----------	0-7	Very shaly silt loam.	GM, GM-GC	A-2, A-4, A-1	5-20	30-60	25-55	20-55	15-50	25-35	4-10
	7-15	Very shaly silt loam, very shaly loam.	GM, GM-GC	A-2, A-4, A-1	10-25	30-60	25-55	20-55	15-50	25-35	4-10
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Manlius---------	0-8	Shaly silt loam	ML, GM, SM, CL-ML	A-4, A-2	5-25	55-80	50-75	35-75	25-70	25-35	4-10
	8-23	Very shaly silt loam, very shaly loam.	GM, GM-GC, GW-GM	A-2, A-4, A-1	10-25	25-60	20-55	15-55	10-50	25-35	4-10
	23-30	Very shaly silt loam, very shaly loam.	GM, GM-GC, GW-GM	A-1, A-2, A-4	10-25	20-60	15-55	10-55	5-50	25-35	4-10
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
NrC*, NrD*:											
Nassau----------	0-7	Very shaly silt loam.	GM, GM-GC	A-2, A-4, A-1	5-20	30-60	25-55	20-55	15-50	25-35	4-10
	7-15	Very shaly silt loam, very shaly loam.	GM, GM-GC	A-2, A-4, A-1	10-25	30-60	25-55	20-55	15-50	25-35	4-10
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
ObA*:											
Occum variant---	0-8	Silt loam--------	SM, ML	A-2, A-4	0	95-100	75-100	50-90	30-80	<25	NP-4
	8-30	Silt loam, loam, sandy loam.	SM, ML	A-2, A-4, A-1	0	95-100	75-100	45-90	20-75	<20	NP-2
	30-60	Very gravelly loamy sand, loamy sand, gravelly sand.	SM, SP, GM, GP	A-1, A-2	0-5	35-100	30-95	15-70	2-30	---	NP
Barbour variant-	0-9	Silt loam--------	ML, CL-ML	A-4	0	95-100	80-100	70-100	50-90	15-25	2-7
	9-35	Silt loam, loam, fine sandy loam.	ML, CL-ML	A-4	0	95-100	80-100	70-100	50-90	15-25	2-7
	35-60	Very gravelly loamy sand, sand, gravelly loamy sand.	SM, SP, GM, GP	A-1, A-2	0-5	35-100	30-100	75-75	2-30	---	NP

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PaA---------- Palms	0-18	Sapric material	PT	---	---	---	---	---	---	---	---
	18-60	Clay loam, silty clay loam, fine sandy loam.	CL-ML, CL	A-4, A-6	0	85-100	80-100	70-95	50-90	25-40	5-20
Pg*. Pits											
PtB, PtC--------- Pittstown	0-9	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6, A-7	0-15	65-80	60-70	50-70	30-65	25-45	4-15
	9-24	Silt loam, channery loam, very fine sandy loam.	ML, SM, CL-ML, GM	A-2, A-4	0-15	65-95	60-90	50-90	30-80	20-35	2-10
	24-60	Channery silt loam, channery loam, very fine sandy loam.	ML, SM, CL, GM	A-2, A-4	0-15	60-95	55-85	45-85	30-75	20-30	2-10
PuC*: Pittstown-------	0-9	Very stony silt loam.	ML, SM, CL-ML, GM	A-2, A-4, A-6, A-7	10-20	65-90	60-85	50-85	30-75	25-45	4-15
	9-24	Silt loam, very fine sandy loam, channery loam.	ML, SM, CL-ML, GM	A-2, A-4	0-15	65-95	60-90	50-90	30-80	20-35	2-10
	24-60	Channery silt loam, channery very fine sandy loam, loam.	ML, SM, CL, GM	A-2, A-4	0-15	60-95	55-85	45-85	30-75	20-30	2-10
Bernardston-----	0-8	Very stony silt loam.	ML, CL-ML, SM, GM	A-2, A-4, A-6, A-7	10-20	60-90	45-85	40-85	30-75	24-45	4-14
	8-30	Silt loam, loam, channery silt loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-95	50-90	45-90	30-80	22-35	2-10
	30-60	Channery silt loam, loam, channery loam.	ML, CL-ML, SM, GM	A-2, A-4	0-10	65-90	50-85	45-85	30-75	20-32	2-8
RaA---------- Raynham	0-14	Silt loam--------	ML	A-4	0	100	95-100	80-100	55-95	<25	NP-10
	14-26	Silt loam, loam, very fine sandy loam.	ML	A-4	0	100	95-100	80-100	55-95	<25	NP-10
	26-60	Silt loam, silt, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	70-95	<25	NP-10
RhA, RhB--------- Rhinebeck	0-8	Silt loam--------	ML, MH, CL, CH	A-6, A-7	0	90-100	85-100	70-100	60-90	30-55	10-25
	8-36	Silty clay loam, silty clay.	CH, CL	A-7, A-6	0	90-100	85-100	80-100	70-100	30-55	15-30
	36-62	Silty clay loam, silty clay, clay.	CH, CL	A-7, A-6	0	90-100	85-100	80-100	70-100	30-55	15-30
RkA, RkB, RkC---- Riverhead	0-6	Fine sandy loam	SM, ML	A-2, A-4	0-5	95-100	90-100	55-95	30-75	14-18	1-3
	6-35	Sandy loam, fine sandy loam, gravelly sandy loam.	SM, GM	A-2, A-4, A-1	0-5	65-100	60-95	40-80	20-45	14-18	1-3
	35-60	Stratified sand and gravel.	SP, SW, SP-SM	A-1	0-5	60-95	55-90	25-50	0-10	---	NP
Sa*: Saprists.											
Aquents.											

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
ScA, ScB--------- Scio	0-12	Very fine sandy loam.	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
	12-41	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
	41-60	Stratified very gravelly sand to silt loam.	ML, SM, SP, GP-GM	A-4, A-2, A-1, A-3	0	35-95	30-90	15-85	2-80	<10	NP-4
SrA, SrB--------- Scriba	0-21	Silt loam--------	ML, SM, CL-ML	A-4, A-2	0-5	80-90	75-85	50-85	30-80	<20	NP-5
	21-50	Gravelly fine sandy loam, very gravelly sandy loam, gravelly silt loam.	GM, ML, SM, CL-ML	A-2, A-4, A-1	0-5	35-75	30-70	20-65	15-60	<20	NP-5
	50-60	Gravelly fine sandy loam, very gravelly sandy loam, gravelly silt loam.	GM, ML, SM, CL-ML	A-2, A-4, A-1	5-10	35-75	30-70	20-65	15-60	<20	NP-5
StB---------- Scriba	0-21	Very stony silt loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	5-10	55-80	50-75	40-75	20-70	<20	NP-5
	21-50	Gravelly fine sandy loam, very gravelly sandy loam, gravelly silt loam.	GM, ML, SM, CL-ML	A-2, A-4, A-1	0-5	35-75	30-70	20-65	15-60	<20	NP-5
	50-60	Gravelly fine sandy loam, very gravelly sandy loam, gravelly silt loam.	GM, ML, SM, CL-ML	A-2, A-4, A-1	5-10	35-75	30-70	20-65	15-60	<20	NP-5
SvB*: Scriba----------	0-21	Very stony silt loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	5-10	55-80	50-75	40-75	20-70	<20	NP-5
	21-50	Gravelly fine sandy loam, very gravelly sandy loam, gravelly silt loam.	GM, ML, SM, CL-ML	A-2, A-4, A-1	0-5	35-75	30-70	20-65	15-60	<20	NP-5
	50-60	Gravelly fine sandy loam, very gravelly sandy loam, gravelly silt loam.	GM, ML, SM, CL-ML	A-2, A-4, A-1	5-10	35-75	30-70	20-65	15-60	<20	NP-5
Pittstown-------	0-9	Very stony silt loam.	ML, SM, CL-ML, GM	A-2, A-4, A-6, A-7	10-20	65-90	60-85	50-85	30-75	25-45	4-15
	9-24	Silt loam, very fine sandy loam, channery loam.	ML, SM, CL-ML, GM	A-2, A-4	0-15	65-95	60-90	50-90	30-80	20-35	2-10
	24-60	Channery silt loam, channery very fine sandy loam, loam.	ML, SM, CL, GM	A-2, A-4	0-15	60-95	55-85	45-85	30-75	20-30	2-10
SwA---------- Shaker	0-9	Very fine sandy loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	9-23	Fine sandy loam, very fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	23-48	Silty clay loam, silty clay, clay.	CL, CH	A-7, A-6	0	100	95-100	90-100	75-95	35-65	15-45
	48-60	Loamy fine sand	SM, SP-SM, SW-SM	A-2	0	100	90-100	40-95	5-20	---	NP

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TeA---------- Teel	0-12	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	95-100	90-100	70-90	15-35	2-15
	12-40	Silt loam, very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	95-100	90-100	65-90	15-35	2-15
	40-60	Silt loam, fine sandy loam, gravelly very fine sandy loam.	ML, SM, CL, SM-SC	A-4, A-6, A-2	0-5	75-100	70-100	50-100	30-90	<30	NP-15
Ud*, Ue*. Udorthents											
UnA, UnB, UnC---- Unadilla	0-7	Silt loam--------	ML	A-4	0	100	95-100	90-100	70-90	<35	NP-10
	7-62	Silt loam, very fine sandy loam.	ML, CL-ML, CL	A-4	0	100	95-100	90-100	70-90	<25	NP-10
Ur*. Urban land											
WnA, WnB, WnC, WnE---------- Windsor	0-8	Loamy sand-------	SM	A-2, A-1	0	95-100	85-100	35-85	20-35	---	NP
	8-21	Loamy sand, loamy fine sand, sand.	SW-SM, SM, SP-SM	A-2, A-1	0	95-100	85-100	45-95	10-30	---	NP
	21-60	Sand, fine sand	SP-SM, SM	A-2, A-3, A-1	0	90-100	75-100	40-95	5-20	---	NP

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
AlB, AlC, AlD----	0-9	15-27	1.20-1.40	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.32	3-2	1-4
Albrights	9-19	18-35	1.30-1.50	0.6-2.0	0.10-0.14	4.5-5.5	Low----------	0.28		
	19-60	18-35	1.40-1.70	0.2-0.6	0.04-0.08	5.6-7.3	Low----------	0.28		
AmC, AmD---------	0-9	15-27	1.20-1.40	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.32	3-2	1-4
Albrights	9-19	18-35	1.30-1.50	0.6-2.0	0.10-0.14	4.5-5.5	Low----------	0.28		
	19-60	18-35	1.40-1.70	0.2-0.6	0.04-0.08	5.6-7.3	Low----------	0.28		
AnA----------	0-7	15-27	1.10-1.40	0.6-2.0	0.16-0.22	5.1-7.3	Low----------	0.37	5	4-10
Alden	7-40	18-35	1.20-1.50	0.2-0.6	0.14-0.20	5.6-7.3	Low----------	0.37		
	40-60	18-35	1.50-1.80	0.06-0.6	0.08-0.15	6.1-8.4	Low----------	0.28		
AoA----------	0-7	15-27	1.10-1.40	0.6-2.0	0.16-0.22	5.1-7.3	Low----------	0.28	5	4-10
Alden	7-40	18-35	1.20-1.50	0.2-0.6	0.14-0.20	5.6-7.3	Low----------	0.37		
	40-60	18-35	1.50-1.80	0.06-0.6	0.08-0.15	6.1-8.4	Low----------	0.28		
BeB, BeC, BeD, BeE----------	0-8	2-12	1.00-1.20	0.6-2.0	0.13-0.17	4.5-6.0	Low----------	0.24	3	2-5
Bernardston	8-30	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	30-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
BfC, BfD---------	0-8	2-12	1.00-1.20	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.24	3	2-5
Bernardston	8-30	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	30-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
BnB*, BnC*, BnD*:										
Bernardston-----	0-8	2-12	1.00-1.20	0.6-2.0	0.13-0.17	4.5-6.0	Low----------	0.24	3	2-5
	8-30	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	30-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
Nassau----------	0-7	1-10	1.10-1.40	0.6-2.0	0.07-0.12	4.5-5.5	Low----------	0.20	2	3-5
	7-15	1-10	1.20-1.50	0.6-2.0	0.07-0.12	4.5-5.5	Low----------	0.20		
	15	---	---	---	---	---	----------	----		
BoD*:										
Bernardston-----	0-8	2-12	1.00-1.20	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.24	3	2-5
	8-30	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	30-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
Pittstown-------	0-9	2-12	1.00-1.30	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.24	3	2-6
	9-24	2-12	1.30-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37		
	24-60	2-12	1.70-2.00	0.06-0.2	0.10-0.15	4.5-6.0	Low----------	0.24		
BrA----------	0-11	4-10	0.90-1.20	0.6-6.0	0.08-0.17	4.5-6.5	Low----------	0.24	3	4-8
Brayton	11-19	4-10	1.40-1.70	0.6-6.0	0.08-0.17	4.5-6.5	Low----------	0.24		
	19-60	4-10	1.70-2.00	<0.2	0.01-0.05	5.6-7.3	Low----------	0.24		
BuC, BuD, BuF----	0-2	5-10	1.00-1.30	0.6-2.0	0.16-0.21	4.5-5.5	Low----------	0.24	3	3-6
Buckland	2-22	5-10	1.10-1.40	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.24		
	22-60	7-14	1.70-1.90	0.06-0.2	0.06-0.12	5.1-6.0	Low----------	----		
CaA----------	0-62	---	0.13-0.23	0.2-6.0	0.35-0.45	4.5-7.3	----------	----	---	>70
Carlisle										
CbA----------	0-10	6-18	1.10-1.40	0.6-6.0	0.09-0.16	4.5-6.0	Low----------	0.17	3	4-10
Castile	10-32	4-15	1.25-1.55	2.0-6.0	0.05-0.13	4.5-6.0	Low----------	0.17		
	32-60	2-10	1.45-1.65	>6.0	0.01-0.02	5.1-7.3	Low----------	0.17		
ChA, ChB---------	0-7	6-18	1.20-1.50	0.6-6.0	0.08-0.15	4.5-5.5	Low----------	0.24	3	2-6
Chenango	7-43	6-18	1.25-1.55	0.6-6.0	0.05-0.14	4.5-6.0	Low----------	0.17		
	43-78	1-8	1.45-1.65	6.0-20	0.01-0.03	5.1-7.8	Low----------	0.17		

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
CkB----------	0-10	6-18	1.20-1.50	0.6-6.0	0.08-0.15	4.5-5.5	Low----------	0.24	3	2-6
Chenango	10-24	6-18	1.25-1.55	0.6-6.0	0.05-0.14	4.5-6.0	Low----------	0.17		
	24-60	1-8	1.45-1.65	6.0-20	0.01-0.03	5.1-7.8	Low----------	0.17		
Du*.										
Dumps										
ElB----------	0-9	2-8	1.05-1.30	2.0-6.0	0.14-0.24	5.1-6.0	Low----------	0.24	3	2-6
Elmridge	9-36	2-8	1.35-1.60	2.0-6.0	0.13-0.22	5.1-6.0	Low----------	0.24		
	36-60	35-60	1.55-1.80	<0.2	0.12-0.18	5.1-6.0	Moderate-----	0.49		
FlA*:										
Fluvaquents.										
Udifluvents.										
FrA----------	0-8	7-20	1.20-1.40	0.6-2.0	0.12-0.20	5.1-7.3	Low----------	0.24	3	3-5
Fredon	8-23	7-20	1.20-1.40	0.2-2.0	0.12-0.20	5.1-7.3	Low----------	0.24		
	23-60	2-10	1.30-1.50	6.0-20	0.02-0.06	5.1-8.4	Low----------	0.17		
GlC, GlD-----	0-2	4-18	0.60-0.80	0.6-2.0	0.14-0.20	4.5-6.0	Low----------	0.20	2	5-10
Glover	2-18	4-18	1.10-1.70	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	0.20		
	18	---	---	---	---	---	----------	----		
GmF*:										
Glover----------	0-2	4-18	0.60-0.80	0.6-2.0	0.14-0.20	4.5-6.0	Low----------	0.20	2	5-10
	2-18	4-18	1.10-1.70	0.6-2.0	0.12-0.20	4.5-5.0	Low----------	0.20		
	18	---	---	---	---	---	----------	----		
Rock outcrop.										
HaA----------	0-9	8-18	1.15-1.40	0.6-2.0	0.18-0.21	5.1-7.3	Low----------	0.49	5	2-6
Hamlin	9-34	5-18	1.15-1.45	0.6-2.0	0.17-0.19	5.1-7.3	Low----------	0.49		
	34-60	5-18	1.15-1.45	0.6-2.0	0.17-0.19	5.6-7.8	Low----------	0.49		
HbA, HbB-----	0-10	5-18	1.10-1.40	0.6-2.0	0.15-0.25	4.5-6.0	Low----------	0.43	3	2-6
Haven	10-30	2-18	1.25-1.55	0.6-2.0	0.08-0.12	4.5-6.0	Low----------	0.24		
	30-60	0-3	1.45-1.65	>20	0.01-0.03	4.5-6.0	Low----------	0.17		
HoA, HoB, HoC,										
HoD, HoE--------	0-9	1-10	1.10-1.40	2.0-20	0.05-0.12	4.5-5.5	Low----------	0.17	3-2	2-6
Hoosic	9-23	1-10	1.25-1.55	2.0-20	0.05-0.11	4.5-5.5	Low----------	0.17		
	23-60	0-5	1.45-1.65	>20	0.01-0.05	4.5-6.0	Low----------	0.17		
HuB, HuC, HuD,										
HuE----------	0-8	20-40	1.00-1.25	0.2-2.0	0.16-0.21	5.1-7.3	Moderate-----	0.49	3	3-6
Hudson	8-16	35-60	1.15-1.40	<0.2	0.13-0.17	5.1-7.3	Moderate-----	0.28		
	16-28	25-60	1.15-1.40	<0.2	0.13-0.17	5.6-7.8	Moderate-----	0.28		
	28-60	35-60	1.15-1.40	<0.2	0.12-0.20	6.6-8.4	Moderate-----	0.28		
LmA----------	0-8	4-10	1.10-1.50	0.6-2.0	0.18-0.30	5.1-7.3	Low----------	0.49	3	2-5
Limerick	8-60	1-8	1.20-1.50	0.6-2.0	0.18-0.25	5.6-7.3	Low----------	0.49		
LoA*:										
Loxley----------	0-60	---	0.10-0.35	0.2-6.0	0.35-0.45	3.6-5.5	----------	----	---	>70
Beseman---------	0-38	---	0.10-0.25	0.2-6.0	0.55-0.65	3.6-5.0	----------	----	---	>70
	38-60	10-28	1.45-1.65	0.2-0.6	0.11-0.18	3.6-7.3	Low----------	----		
MaC*, MaE*, MaF*:										
Macomber--------	0-3	10-27	1.10-1.40	0.6-2.0	0.10-0.17	4.5-5.5	Low----------	0.24	3	2-6
	3-23	10-27	1.20-1.50	0.6-2.0	0.04-0.11	4.5-5.5	Low----------	0.24		
	23	---	---	---	---	---	----------	----		
Taconic---------	0-5	10-27	1.10-1.40	0.6-6.0	0.10-0.17	4.5-5.5	Low----------	0.24	2	2-6
	5-14	10-27	1.20-1.50	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.24		
	14	---	---	---	---	---	----------	----		

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
MbA----------	0-7	25-55	1.00-1.25	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37	5	4-10
Madalin	7-39	27-60	1.20-1.40	0.06-0.2	0.12-0.13	5.6-7.8	Moderate-----	0.28		
	39-60	40-60	1.15-1.40	<0.2	0.12-0.13	7.4-8.4	Moderate-----	0.28		
NaB*, NaC*:										
Nassau----------	0-7	1-10	1.10-1.40	0.6-2.0	0.07-0.12	4.5-5.5	Low----------	0.20	2	3-5
	7-15	1-10	1.20-1.50	0.6-2.0	0.07-0.12	4.5-5.5	Low----------	0.20		
	15	---	---	---	---	---	----------	----		
Manlius---------	0-8	6-18	1.10-1.40	0.6-2.0	0.10-0.18	3.6-5.5	Low----------	0.28	3	1-5
	8-23	6-18	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.20		
	23-30	6-18	1.70-1.95	0.6-2.0	0.03-0.09	4.5-6.5	Low----------	0.20		
	30	---	---	---	---	---	----------	----		
NrC*, NrD*:										
Nassau----------	0-7	1-10	1.10-1.40	0.6-2.0	0.07-0.12	4.5-5.5	Low----------	0.20	2	3-5
	7-15	1-10	1.20-1.50	0.6-2.0	0.07-0.12	4.5-5.5	Low----------	0.20		
	15	---	---	---	---	---	----------	----		
Rock outcrop.										
ObA*:										
Occum variant---	0-8	5-18	1.15-1.40	0.6-2.0	0.16-0.21	5.1-6.0	Low----------	0.32	3	2-6
	8-30	5-18	1.15-1.40	0.6-2.0	0.09-0.20	5.1-6.0	Low----------	0.32		
	30-60	2-5	1.40-1.60	6.0-20	0.02-0.07	5.1-6.0	Low----------	0.17		
Barbour variant-	0-9	5-18	1.15-1.40	0.6-2.0	0.16-0.21	5.1-6.0	Low----------	0.32	5	2-6
	9-35	5-18	1.15-1.45	0.6-2.0	0.10-0.19	5.1-6.0	Low----------	0.32		
	35-60	2-5	1.40-1.65	>6.0	0.02-0.07	5.1-6.0	Low----------	0.17		
PaA----------	0-18	---	0.25-0.45	0.2-6.0	0.35-0.45	5.1-7.8	----------	----	---	>75
Palms	18-60	7-35	1.45-1.75	0.2-2.0	0.14-0.22	6.1-8.4	Low----------	----		
Pg*.										
Pits										
PtB, PtC---------	0-9	2-12	1.00-1.30	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.24	3	2-6
Pittstown	9-24	2-12	1.30-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37		
	24-60	2-12	1.70-2.00	0.06-0.2	0.10-0.15	4.5-6.0	Low----------	0.24		
PuC*:										
Pittstown-------	0-9	2-12	1.00-1.30	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.24	3	2-6
	9-24	2-12	1.30-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37		
	24-60	2-12	1.70-2.00	0.06-0.2	0.10-0.15	4.5-6.0	Low----------	0.24		
Bernardston-----	0-8	2-12	1.00-1.20	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.24	3	2-5
	8-30	2-12	1.25-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.37		
	30-60	1-12	1.75-1.90	0.06-0.2	0.07-0.16	4.5-6.0	Low----------	0.28		
RaA----------	0-14	3-16	1.20-1.50	0.6-2.0	0.20-0.30	5.1-7.3	Low----------	0.49	3	3-10
Raynham	14-26	3-16	1.20-1.50	0.2-2.0	0.18-0.26	5.1-7.3	Low----------	0.64		
	26-60	3-16	1.20-1.50	0.06-0.2	0.18-0.22	5.6-7.8	Low----------	0.64		
RhA, RhB---------	0-8	15-40	1.00-1.25	0.2-0.6	0.16-0.21	5.1-7.3	Moderate-----	0.49	3	3-7
Rhinebeck	8-36	35-60	1.20-1.40	0.06-0.2	0.12-0.14	5.1-7.8	Moderate-----	0.28		
	36-62	35-60	1.15-1.40	0.06-0.2	0.12-0.14	6.1-8.4	Moderate-----	0.28		
RkA, RkB, RkC----	0-6	3-10	1.10-1.40	2.0-6.0	0.14-0.20	3.6-6.0	Low----------	0.28	3	2-4
Riverhead	6-35	1-8	1.25-1.55	2.0-6.0	0.09-0.13	3.6-6.0	Low----------	0.28		
	35-60	1-8	1.45-1.65	>20	0.02-0.04	4.5-7.3	Low----------	0.17		
Sa*:										
Saprists.										
Aquents.										

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
ScA, ScB--------- Scio	0-12 12-41 41-60	2-15 2-15 0-5	1.20-1.50 1.20-1.50 1.45-1.65	0.6-2.0 0.6-2.0 2.0-20	0.18-0.21 0.17-0.20 0.02-0.19	4.5-6.0 4.5-6.0 5.1-7.8	Low---------- Low---------- Low----------	0.49 0.64 0.17	3	2-8
SrA, SrB--------- Scriba	0-21 21-50 50-60	1-18 1-18 1-18	1.10-1.40 1.70-2.00 1.65-1.95	0.6-2.0 0.06-0.2 0.06-0.2	0.14-0.18 0.01-0.04 0.01-0.04	3.6-6.5 5.1-7.3 5.1-8.4	Low---------- Low---------- Low----------	0.28 0.20 0.20	3	3-7
StB-------------- Scriba	0-21 21-50 50-60	1-18 1-18 1-18	1.10-1.40 1.70-2.00 1.65-1.95	0.6-2.0 0.06-0.2 0.06-0.2	0.08-0.16 0.01-0.04 0.01-0.04	3.6-6.5 5.1-7.3 5.1-8.4	Low---------- Low---------- Low----------	0.20 0.20 0.20	3	3-7
SvB*: Scriba---------- Pittstown------- SwA-------------- Shaker	0-21 21-50 50-60 0-9 9-24 24-60 0-9 9-23 23-48 48-60	1-18 1-18 1-18 2-12 2-12 2-12 2-8 2-8 35-60 2-5	1.10-1.40 1.70-2.00 1.65-1.95 1.00-1.30 1.30-1.60 1.70-2.00 1.00-1.25 1.35-1.60 1.55-1.80 1.40-1.65	0.6-2.0 0.06-0.2 0.06-0.2 0.6-2.0 0.6-2.0 0.06-0.2 2.0-6.0 2.0-6.0 <0.2 6.0-20	0.08-0.16 0.01-0.04 0.01-0.04 0.15-0.20 0.15-0.20 0.10-0.15 0.14-0.24 0.13-0.22 0.12-0.18 0.02-0.08	3.6-6.5 5.1-7.3 5.1-8.4 4.5-6.0 4.5-6.0 4.5-6.0 5.1-6.5 5.1-6.5 5.6-7.3 5.6-7.8	Low---------- Low---------- Low---------- Low---------- Low---------- Low---------- Low---------- Low---------- Moderate----- Low----------	0.20 0.20 0.20 0.24 0.37 0.24 0.24 0.24 0.49 0.17	3 3 3	3-7 2-6 2-10
TeA-------------- Teel	0-12 12-40 40-60	8-18 5-18 3-10	1.15-1.40 1.15-1.45 1.25-1.55	0.6-2.0 0.6-2.0 0.6-2.0	0.18-0.21 0.17-0.19 0.12-0.19	5.1-7.3 5.1-7.8 5.6-7.8	Low---------- Low---------- Low----------	0.49 0.49 0.49	5	2-6
Ud*, Ue*. Udorthents										
UnA, UnB, UnC---- Unadilla	0-7 7-62	2-18 1-18	1.20-1.50 1.20-1.50	0.6-2.0 0.6-2.0	0.18-0.21 0.17-0.20	4.5-6.0 4.5-7.3	Low---------- Low----------	0.49 0.64	3	2-7
Ur*. Urban land										
WnA, WnB, WnC, WnE-------------- Windsor	0-8 8-21 21-60	1-3 0-3 0-2	1.00-1.20 1.30-1.55 1.40-1.65	>6.0 >6.0 >6.0	0.08-0.12 0.02-0.12 0.01-0.08	4.5-6.0 4.5-6.0 4.5-6.5	Low---------- Low---------- Low----------	0.17 0.17 0.17	5	2-4

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

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				
AlB, AlC, AlD, AmC, AmD---------- Albrights	C	None--------	---	---	1.5-3.0	Perched	Nov-Mar	>60	---	Moderate	High-----	High.
AnA, AoA---------- Alden	D	None--------	---	---	0-0.5	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
BeB, BeC, BeD, BeE---------- Bernardston	C	None--------	---	---	1.5-2.0	Perched	Feb-Apr	>60	---	Moderate	Low------	High.
BfC, BfD---------- Bernardston	C	None--------	---	---	1.5-2.0	Perched	Feb-Apr	>60	---	Moderate	Low------	High.
BnB*, BnC*, BnD*: Bernardston------	C	None--------	---	---	1.5-2.0	Perched	Feb-Apr	>60	---	Moderate	Low------	High.
Nassau----------	C	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
BoD*: Bernardston------	C	None--------	---	---	0.5-2.0	Perched	Feb-Apr	>60	---	Moderate	Low------	High.
Pittstown--------	C	None--------	---	---	1.5-3.0	Perched	Nov-Apr	>60	---	Moderate	Moderate	High.
BrA---------- Brayton	C	None--------	---	---	0-1.5	Perched	Nov-May	>60	---	High-----	High-----	Moderate.
BuC, BuD, BuF----- Buckland	C	None--------	---	---	1.0-2.0	Perched	Jan-May	>60	---	Moderate	Low------	Moderate.
CaA**---------- Carlisle	A/D	None--------	---	---	+1-1.0	Apparent	Sep-Jun	>60	---	High-----	High-----	Low.
CbA---------- Castile	B	None--------	---	---	1.5-2.0	Apparent	Mar-May	>60	---	High-----	Moderate	Moderate.
ChA, ChB---------- Chenango	A	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
CkB---------- Chenango	A	Rare--------	---	---	3.0-6.0	Apparent	Apr-May	>60	---	Moderate	Low------	Moderate.
Du*. Dumps												
ElB---------- Elmridge	C	None--------	---	---	1.5-3.0	Perched	Nov-May	>60	---	High-----	Moderate	Moderate.
FlA*: Fluvaquents.												

See footnotes at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
FlA*: Udifluvents.												
FrA---------- Fredon	C	None--------	---	---	0-1.5	Apparent	Oct-Jun	>60	---	High-----	Low------	Low.
GlC, GlD---------- Glover	C/D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	Low.
GmF*: Glover----------	C/D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	Low.
Rock outcrop.												
HaA---------- Hamlin	B	Occasional	Brief-----	Nov-May	3.0-6.0	Apparent	Nov-May	>60	---	High-----	Low------	Low.
HbA, HbB---------- Haven	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
HoA, HoB, HoC, HoD, HoE---------- Hoosic	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
HuB, HuC, HuD, HuE---------- Hudson	C	None--------	---	---	1.5-2.0	Perched	Nov-Apr	>60	---	High-----	High-----	Low.
LmA---------- Limerick	C	Frequent----	Brief-----	Jan-Jun	0.5-1.5	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
LoA*: Loxley**----------	A/D	None--------	---	---	+1-1.0	Apparent	Nov-May	>60	---	High-----	High-----	High.
Beseman**---------	A/D	None--------	---	---	+2-1.0	Apparent	Jan-Dec	>60	---	High-----	High-----	High.
MaC*, MaE*, MaF*: Macomber----------	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	High.
Taconic----------	C/D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
MbA---------- Madalin	D	None--------	---	---	0-0.5	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
NaB*, NaC*: Nassau----------	C	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
Manlius----------	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	Moderate.

See footnotes at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
NrC*, NrD*: Nassau	C	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
Rock outcrop.												
ObA*: Occum variant	B	Frequent	Brief	Nov-Apr	1.5-3.0	Apparent	Nov-Apr	>60	---	High	Moderate	Moderate.
Barbour variant	B	Occasional	Brief	Nov-Apr	3.0-6.0	Apparent	Feb-Apr	>60	---	Moderate	Low	Moderate.
PaA**: Palms	A/D	None	---	---	+1-1.0	Apparent	---	>60	---	High	High	Moderate.
Pg*. Pits												
PtB, PtC Pittstown	C	None	---	---	1.5-3.0	Perched	Nov-Apr	>60	---	Moderate	Moderate	High.
PuC*: Pittstown	C	None	---	---	1.5-3.0	Perched	Nov-Apr	>60	---	Moderate	Moderate	High.
Bernardston	C	None	---	---	1.5-2.0	Perched	Feb-Apr	>60	---	Moderate	Low	High.
RaA Raynham	C	None	---	---	0.5-2.0	Apparent	Nov-May	>60	---	High	High	Moderate.
RhA, RhB Rhinebeck	D	None	---	---	0.5-1.5	Perched	Jan-May	>60	---	High	High	Low.
RkA, RkB, RkC Riverhead	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Sa*: Saprists.												
Aquents.												
ScA, ScB Scio	B	None	---	---	1.5-2.0	Apparent	Mar-May	>60	---	High	Moderate	Moderate.
SrA, SrB Scriba	C	None	---	---	0.5-1.5	Perched	Feb-Mar	>60	---	High	Moderate	Moderate.
StB Scriba	C	None	---	---	0.5-1.5	Perched	Feb-Apr	>60	---	High	Moderate	Moderate.
SvB*: Scriba	C	None	---	---	0.5-1.5	Perched	Feb-Apr	>60	---	High	Moderate	Moderate.
Pittstown	C	None	---	---	1.5-3.0	Perched	Nov-Apr	>60	---	Moderate	Moderate	High.
SwA Shaker	C	None	---	---	0-1.5	Apparent	Nov-May	>60	---	High	Moderate	Moderate.

See footnotes at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
TeA---------- Teel	B	Occasional	Brief-----	Nov-May	0.5-2.0	Apparent	Jan-May	>60	---	High-----	Moderate	Low.
Ud*, Ue*. Udorthents												
UnA, UnB, UnC----- Unadilla	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Low------	Moderate.
Ur*. Urban land												
WnA, WnB, WnC, WnE---------- Windsor	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

** In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table rises above the surface. The first numeral in the range indicates the highest level of water above the surface. The second numeral indicates the depth below the surface.

TABLE 19.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number,* horizon, and depth in inches	Classification		Grain size distribution											Liquid limit	Plasticity index	Moisture density		Linear shrinkage
				Percentage passing sieve--							Percentage smaller than--							
	AASHTO	Unified	>3 inch **	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	
			Pct											Pct		Lb/Ft^3	Pct	Pct
Castile (S76NY-083-014)																		
AP--------0 to 10	A-4 (00)	ML	3	98	94	89	82	75	62	54	24	13	8	28	4	111	14	3.2
B21------10 to 19	A-1-6(00)	SM	3	90	77	66	54	43	30	25	10	6	4	25	3	124	10	3.0
B22------19 to 27	A-1-a(00)	SW-SM	3	92	80	71	57	39	17	8	5	3	2	--	NP	128	10	2.6
B3-------27 to 32	A-1-a(00)	SW-SM	8	100	95	85	67	45	19	9	4	3	2	--	NP	131	9	--
IIC------32 to 60	A-1-6(00)	SW-SM	10	100	98	93	84	70	25	6	3	2	1	--	NP	124	12	0.4
Glover (S76NY-083-022)																		
A1--------0 to 2	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B21--------2 to 4	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B22--------4 to 18	A-4 (00)	SM	5	90	79	73	69	66	60	46	20	7	3	--	NP	91	26	3.0
R---------18	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hudson (S76NY-083-018)																		
Ap--------0 to 9	A-4 (07)	CL-ML	0	100	100	100	100	100	96	82	46	29	15	31	9	102	19	5.2
B2A-------- 9 to 14	A-6 (13)	CL	0	100	100	100	100	100	98	89	68	57	40	33	14	103	22	6.8
B21t-----14 to 28	A-7-6(28)	CL	0	100	100	100	100	100	100	96	81	71	52	49	25	96	26	10.0
B22t-----28 to 38	A-7-6(26)	CL	0	100	100	100	100	100	100	96	82	70	50	47	23	95	26	9.4
B3-------38 to 60	A-7-6(26)	CL-ML	0	100	100	100	100	100	99	99	92	72	48	46	21	95	27	9.0
Madalin (S76NY-083-020)																		
AP--------0 to 7	A-7-5(23)	OH	0	100	100	100	100	100	98	96	74	58	43	55	15	76	40	10.4
A2--------7 to 11	A-7-6(30)	CH	0	100	100	100	100	100	100	99	77	68	58	53	25	--	--	12.0
B2tg-----11 to 22	A-7-5(45)	CH	0	100	100	100	100	100	99	99	90	84	70	67	36	91	28	14.4
B22tg----22 to 39	A-7-6(35)	CH	0	100	100	100	100	100	100	99	94	86	64	54	28	95	28	10.4
C--------39 to 60	A-7-6(37)	CH	0	100	100	100	100	100	100	99	91	79	57	58	31	95	26	12.0
Manlius (S76NY-083-011)																		
AP--------0 to 8	A-4 (00)	SM	5	98	87	76	68	55	45	42	22	10	5	36	6	110	15	4.6
B21--------8 to 15	A-2-4(00)	GM-GC	10	99	82	69	57	46	34	30	16	9	6	28	5	120	12	4.0
B22------14 to 23	A-2-4(00)	GW-GM	20	90	52	34	23	17	12	10	5	3	2	33	7	121	13	4.0
C--------23 to 30	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R--------30	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

See footnote at end of table.

TABLE 19.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number,* horizon, and depth in inches	Classification		Grain size distribution											Liquid limit	Plasticity index	Moisture density		Linear shrinkage
			Percentage passing sieve--							Percentage smaller than--								
	AASHTO	Unified	>3 inch **	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	
			Pct											Pct		Lb/Ft^3	Pct	Pct
Nassau (S76NY-083-012)																		
Ap--------0 to 7	A-4 (00)	GM	10	100	86	77	65	53	40	36	19	8	4	36	4	117	12	4.6
B2--------7 to 15	A-1-b(00)	GM	10	97	73	57	43	33	24	20	11	6	4	32	5	124	12	3.8
IIR------15	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rhinebeck (S76NY-083-019)																		
Ap--------0 to 8	A-6 (08)	CL	0	100	100	100	100	99	94	84	53	38	26	33	12	102	21	5.2
A2--------8 to 11	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B21t-----11 to 16	A-7-6(28)	CH	0	100	100	100	100	100	99	97	88	81	64	51	25	94	27	10.0
B22t-----16 to 36	A-7-6(36)	CH	0	100	100	100	100	100	100	99	93	81	59	56	30	92	29	10.4
C--------36 to 62	A-7-6(29)	CL	0	100	100	100	100	99	99	98	90	73	50	49	25	96	27	9.2
Unadilla (S76NY-083-021)																		
Ap--------0 to 7	A-4 (00)	ML	0	100	100	100	100	100	99	84	29	14	8	24	1	106	17	1.6
B21-------7 to 14	A-4 (00)	ML	0	100	100	100	100	100	100	74	20	10	6	22	3	110	14	0.6
B22------14 to 33	A-4 (00)	ML	0	100	100	100	100	100	99	81	19	9	5	23	1	107	16	0.8
C--------33 to 62	A-4 (00)	ML	0	100	100	100	100	100	99	61	13	7	3	22	1	107	15	0.0

*Locations of the sampled pedons are as follows:

Castile: Town of Schodack, 300 feet west of Julienne Drive, 1/4 mile west of intersection with Richwood Road

Glover: Town of Stephentown, in a wooded area, 300 feet east of fire tower on Seven Hill Road

Hudson: Town of Schodack, 400 feet east of field road, 1/4 mile north of barn

Madalin: Town of Schodack, 900 feet north of county Route 2, 1/2 mile east of the intersection of Route 2 and railroad tracks

Manlius: Town of Nassau, 400 feet east of Lyons Lake Road, 2,000 feet north of U.S. Route 20

Nassau: Town of Nassau, 300 feet east of Lyons Lake Road, 2,000 feet north of U.S. Route 20

Rhinebeck: Town of Schodack, 150 feet east of field road, 1/4 mile north of county Route 2, 3/8 mile west of County Route 1

Unadilla: Town of Schaghticoke, 500 feet north of New York Route 67, 900 feet east of the Hudson River

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Albrights	Fine-loamy, mixed, mesic Aquic Fragiudalfs
Alden	Fine-loamy, mixed, nonacid, mesic Mollic Haplaquepts
Aquents	Aquents
Barbour variant	Coarse-loamy over sandy or sandy skeletal, mixed, mesic Fluventic Dystrochrepts
Bernardston	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Beseman	Loamy, mixed, dysic Terric Borosaprists
Brayton	Coarse-loamy, mixed, frigid Aeric Fragiaquepts
*Buckland	Coarse-loamy, mixed, frigid Entic Fragiorthods
Carlisle	Euic, mesic Typic Medisaprists
Castile	Loamy-skeletal, mixed, mesic Aquic Dystrochrepts
Chenango	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
*Elmridge	Coarse-loamy over clayey, mixed, mesic Aquic Dystric Euthrochrepts
Fluvaquents	Fluvaquents
Fredon	Coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Aeric Haplaquepts
*Glover	Loamy, mixed, frigid Entic Lithic Haplorthods
Hamlin	Coarse-silty, mixed, mesic Dystric Fluventic Eutrochrepts
Haven	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Hoosic	Sandy-skeletal, mixed, mesic Typic Dystrochrepts
Hudson	Fine, illitic, mesic Glossaquic Hapludalfs
Limerick	Coarse-silty, mixed, nonacid, mesic Typic Fluvaquents
Loxley	Dysic Typic Borosaprists
Macomber	Loamy-skeletal, mixed, frigid Typic Dystrochrepts
Madalin	Fine, illitic, mesic Mollic Ochraqualfs
Manlius	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Nassau	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Occum variant	Coarse-loamy, mixed, mesic Fluventic Dystrochrepts
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
Pittstown	Coarse-loamy, mixed, mesic Typic Fragiochrepts
*Raynham	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Rhinebeck	Fine, illitic, mesic Aeric Ochraqualfs
Riverhead	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Saprists	Saprists
Scio	Coarse-silty, mixed, mesic Aquic Dystrochrepts
Scriba	Coarse-loamy, mixed, mesic Aeric Fragiaquepts
Shaker	Coarse-loamy over clayey, mixed, nonacid, mesic Aeric Haplaquepts
Taconic	Loamy-skeletal, mixed, frigid Lithic Dystrochrepts
Teel	Coarse-silty, mixed, mesic Fluvaquentic Eutrochrepts
Udifluvents	Udifluvents
Udorthents	Udorthents
Unadilla	Coarse-silty, mixed, mesic Typic Dystrochrepts
Windsor	Mixed, mesic Typic Udipsamments

*This soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

TABLE 21.--RELATIONSHIP BETWEEN PARENT MATERIAL, POSITION, AND DRAINAGE OF SOIL SERIES

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
	SOILS ON UPLANDS AND MOUNTAINS AT HIGH ELEVATIONS						
Deep, medium textured, brownish soils with a compact fragipan; formed in glacial till			Buckland	Buckland	Brayton	Brayton	
Moderately deep, medium textured brownish soils; formed in glacial till over phyllite, shale, and slate bedrock			Macomber				
Shallow, medium textured, brownish soils; formed in glacial till over phyllite, slate, and shale		Taconic	Taconic				
Shallow, medium textured, brownish soils; formed in glacial till over sandstone		Glover					
	SOILS ON UPLANDS AT LOW ELEVATIONS						
Deep, medium textured brownish soils having a compact fragipan, formed in glacial till			Bernard-ston	Pittstown	Scriba		Alden
Deep, moderately fine textured, reddish soils having a compact fragipan; formed in glacial till				Albrights			
Moderately deep, medium textured, brownish soils; formed in glacial till over soft shale			Manlius				
Shallow, medium textured, brownish soils; formed in glacial till over soft shale		Nassau					
	SOILS ON LACUSTRINE PLAINS AND DELTAS						
Deep, fine textured, grayish and brownish soils; formed in glaciolacustrine deposits				Hudson	Rhinebeck	Madalin	Madalin
Deep, medium textured, brownish soils; formed in glaciolacustrine deposits			Unadilla	Scio	Raynham	Raynham	
Deep, moderately coarse textured, brownish soils formed in glaciofluvial material over fine textured glaciolacustrine deposits				Elmridge	Shaker	Shaker	

See footnote at end of table.

TABLE 21.--RELATIONSHIP BETWEEN PARENT MATERIAL, POSITION, AND DRAINAGE OF SOIL SERIES--Continued

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
	SOILS ON OUTWASH PLAINS, TERRACES, AND ALLUVIAL FANS						
Deep, medium textured to moderately coarse textured, gravelly, brownish soils; formed in glaciofluvial material over sand and gravel		Chenango	Chenango	Castile	Fredona	Fredon	
Deep moderately coarse textured, gravelly, brownish soils; formed in glaciofluvial material over sand and gravel	Hoosic	Hoosic	Hoosic				
Deep, moderately textured, brownish soils; formed in galciofluvial material over sand and gravel or sand			Haven				
Deep, moderately coarse textured, brownish soils; formed in glaciofluvial material over sand and gravel or sand			Riverhead				
Deep, coarse textured, brownish soils; formed in glaciofluvial material over sand	Windsor						
	SOILS ON FLOOD PLAINS						
Deep, medium textured brownish soils; formed in alluvial sediments			Hamlin	Teel	Teel	Limerick	
Deep, medium textured and moderately coarse textured, brownish soils; formed in alluvial sediments over sand and gravel			Barbour variant	Occum variant			
Deep, moderately fine textured to coarse textured soils with variable colors; formed in recent alluvial sediments			Udifluvents	Udifluvents	Fluvaquents	Fluvaquents	Fluvaquents

See footnote at end of table.

TABLE 21.--RELATIONSHIP BETWEEN PARENT MATERIAL, POSITION, AND DRAINAGE OF SOIL SERIES--Continued

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
	SOILS IN SWAMPS AND BOGS						
Soils formed in organic material that is more than 51 inches thick							Carlisle
Soils formed in organic material that is 16 to 50 inches thick.							Palms
Soils formed in organic material that is more than 51 inches thick; at high elevations							Loxley
Soils formed in organic material that is 16 to 50 inches thick; at high elevations							Beseman
Soils formed in organic material that is more than 16 inches thick and is ponded most of the year							Saprists
Deep moderately fine textured to coarse textured, grayish soils, formed in glacial till, glaciolacustrine, or alluvial deposits							Aquents
	SOILS ON UPLANDS, OUTWASH PLAINS, AND FLOOD PLAINS						
Deep, fine textured to coarse textured, brownish soils that are recent excavations on fill deposits	Udorthents	Udorthents	Udorthents	Udorthents			

*Texture refers to dominant subsoil texture.

* U.S. GOVERNMENT PRINTING OFFICE : 1987 O - 477-017 : QL 3

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.