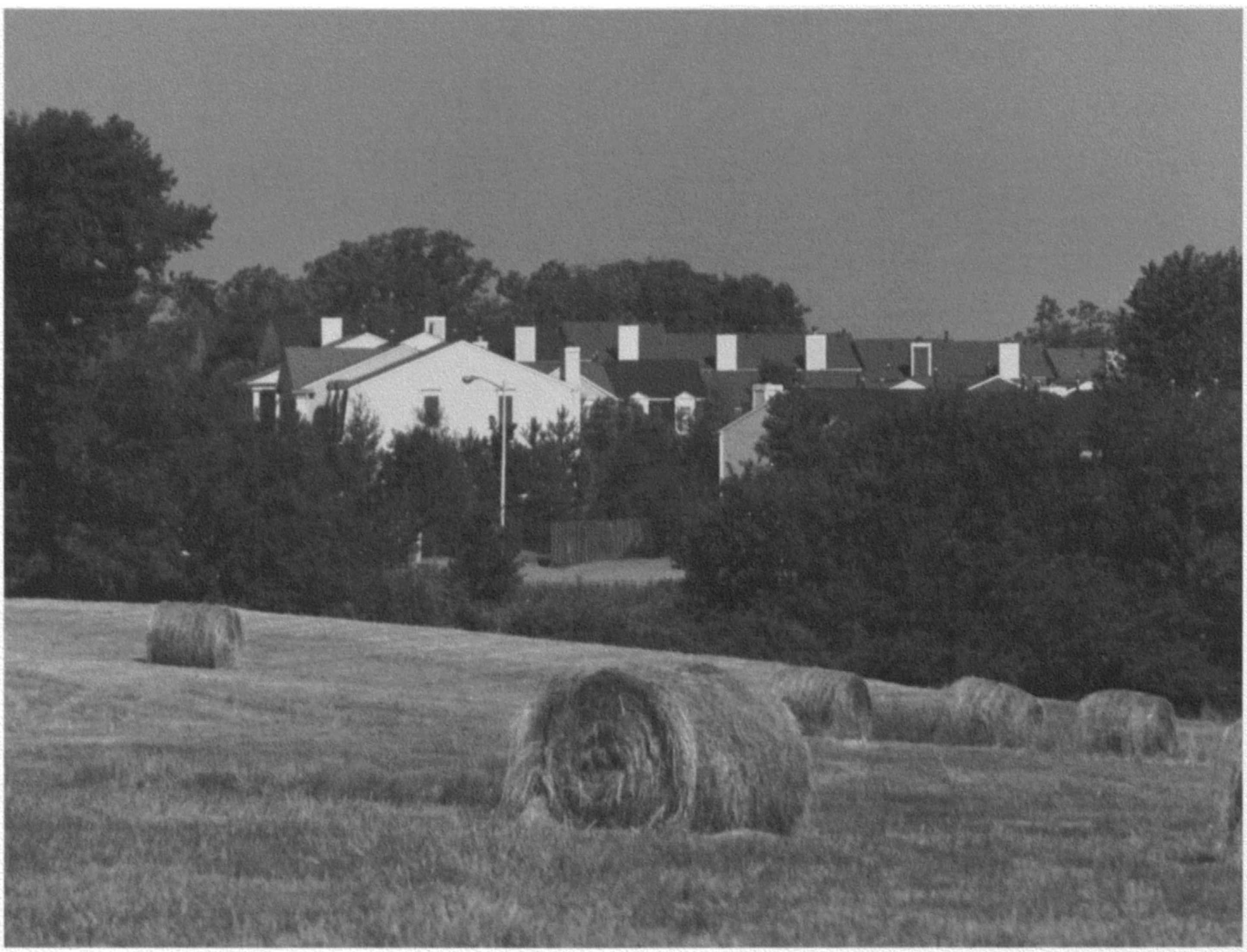
United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Maryland Agricultural
Experiment Station and
Montgomery Soil
Conservation District

Soil Survey of Montgomery County, Maryland



How To Use This Soil Survey

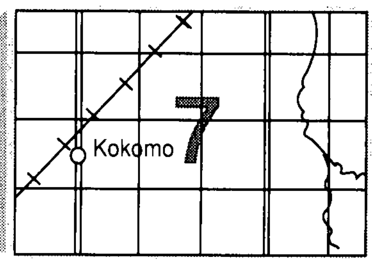
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

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

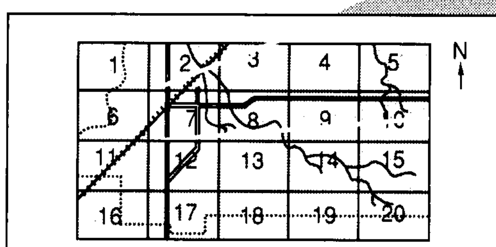
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



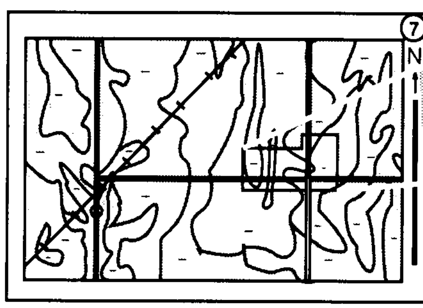
MAP SHEET

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



INDEX TO MAP SHEETS

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



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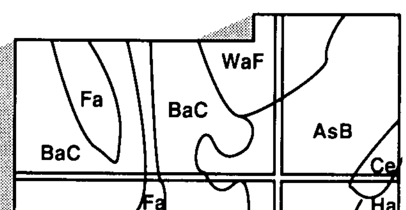

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

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

Major fieldwork for this soil survey was completed in 1988. Soil names and descriptions were approved in 1989. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1988. This survey was made cooperatively by the Natural Resources Conservation Service, the Maryland Agricultural Experiment Station, and the Montgomery Soil Conservation District. The survey is part of the technical assistance furnished to the Montgomery Soil Conservation District. Partial funding for the survey was provided by Montgomery County.

Cover: Hayland and urban development in an area of Occoquan loam, 3 to 8 percent slopes, near Germantown.

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Issued July 1995

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Foreword

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

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

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

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

Jeri Berc
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Montgomery County, Maryland

Updated and revised survey by James H. Brown and Steve T. Dyer,
Natural Resources Conservation Service

Original survey by E.Z.W. Compy, Walter J. Ellyson, F.A. Filios, B. Laux, R.S. Long, D.G. Morgan, H.J. Rassier, and W.G. Souder, Soil Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
Maryland Agricultural Experiment Station and Montgomery Soil Conservation District

MONTGOMERY COUNTY is in the central part of Maryland (fig. 1). It is bounded on the southwest and west by the Potomac River, on the northwest by Frederick County, on the northeast by Howard County, and on the southeast by Prince Georges County and the District of Columbia. The land area is 316,500 acres, or 494.53 square miles, and the water areas more than 40 acres in size make up 7,000 acres, or about 10.94 square miles.

About one-third of the county is agricultural, and one-third is residential. The rest consists of parks or of areas used for institutions, such as churches, schools, and government facilities.

This soil survey updates the survey of Montgomery County published in 1961 *(4)*. It provides additional information about the soils in the county.

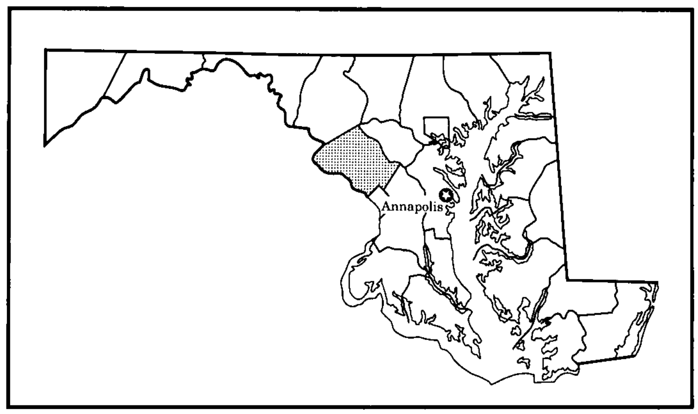

Figure 1.—Location of Montgomery County in Maryland.

General Nature of the County

This section provides general information about Montgomery County. It describes history and population; physiography, drainage, and geology; transportation facilities; water supply; and climate.

History and Population

Montgomery County was established by the Constitutional Convention in 1776. It was named after General Richard Montgomery. The boundaries have remained almost unchanged. Prior to 1776, the survey area was the southeastern part of Frederick County.

During the period 1865 to 1873, the county was primarily agricultural. More than 90 percent of its population was engaged in agricultural enterprises. The principal crops were grain and tobacco. Grist mills were built throughout the county and remained active until about 1925, at which time they began to be replaced by dairy farms.

Gold was discovered near Brookeville in about 1854 and near Croply, Rock Run, and Great Falls during the Civil War. The production of gold extended from 1868 to 1951.

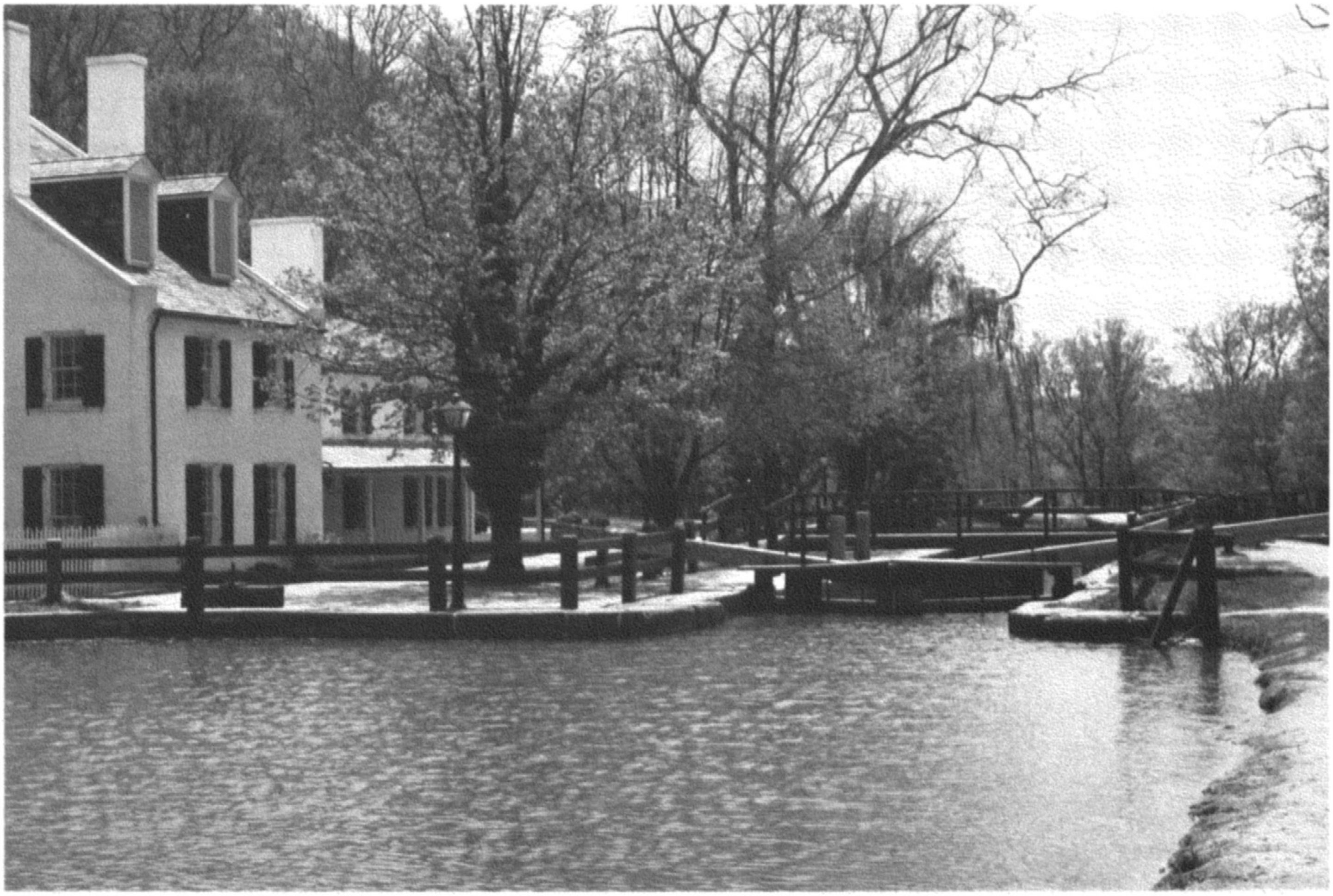

Figure 2.—An area of the Chesapeake and Ohio Canal, which runs through Montgomery County.

Montgomery County began to function as a suburban county with the opening of the Metropolitan Branch of the Baltimore and Ohio Railroad in 1873. Residential development began almost immediately. The initial growth consisted dominantly of the construction of resorts and summer cottages. In 1887, a resort hotel was built on what is now the Walter Reed Army Medical Center Annex.

During the period 1888 to 1913, the construction of trolley lines promoted growth in the Bethesda-Chevy Chase area. Improved accessibility to markets promoted the development of truck farming and dairy industries. One of the first lines of transportation in the county was the Chesapeake and Ohio Canal, which follows the Potomac River (fig. 2). This canal was used in freighting supplies and products into and out of the county. The dairy industry reached its peak about 1936, at which time there was a shift from dairy farming to the production of beef cattle.

In 1935, the first multifamily dwelling in the county was permitted. A surge of suburban growth followed. Building during the late 1930's and 1940's included the construction of Federal installations, such as the David Taylor Model Basin, the National Institutes of Health, and the National Naval Medical Center. The population of the county grew from 18,000 in 1790 to 610,000 in 1984.

Physiography, Drainage, and Geology

Jonathan Edwards, Jr., geologist, Maryland Geological Survey, helped prepare this section.

Almost all of Montgomery County is in the Piedmont physiographic province, where the bedrock consists predominantly of metamorphic rocks of Paleozoic age. Consolidated sedimentary rocks of Triassic age are in a basin in the western part of the county. A very small area along the eastern border is covered by sediments of the Coastal Plain physiographic province, which extend out of Prince Georges County as erosional remnants on the stream divides.

The lowest point in the county is 52 feet above sea level. The highest point is 873 feet above sea level. It is in the northwestern part of the county. The average elevation gradient is 29 feet per mile.

The county is drained by the Potomac and Patuxent Rivers and their tributaries, which flow from northwest to southeast. The gradient of the Potomac River is about 4 feet per mile above Block House Point, 1 foot per mile below Seneca Creek, and 8.5 feet per mile from Seneca Creek to the District of Columbia.

The eastern two-thirds of the Piedmont in Montgomery County consists of a heterogeneous assemblage of rock types that have been called the Wissahickon Group. These range from coarse grained gneiss to mica schist. The gneiss, named the Sykesville Formation *(3)*, is medium to coarse grained plagioclase-muscovite-quartz gneiss containing pebbles and boulders of a number of rock types, principally quartz and mica schist but also granite gneiss, serpentinite, and amphibolite. The major soils in this area are those in the Glenelg-Gaila-Occoquan, Brinklow-Baile-Occoquan, and Urban land-Wheaton-Glenelg general soil map units (fig. 3).

The schist lithology includes muscovite-quartz-plagioclase schist, albite-chlorite schist, and micaceous quartzite or metagraywacke, all of which are characterized by closely spaced, steeply dipping, micaceous foliation. The schist in the eastern part of the county is generally coarser grained than that west of the Sykesville Formation.

Large and small masses of mafic and ultramafic rock are throughout the area of the schist west of the Sykesville Formation. These masses consist of serpentinite, chlorite-talc schist, and chlorite-actinolite schist and generally have a thin mantle of soil. The best examples are south of Hunting Hill, east of Gaithersburg, and east of Quince Orchard. The soils in the Urban land-Wheaton-Glenelg general soil map unit are dominant in this area, especially Conowingo, Watchung, and Travilah soils, which are of minor extent in the unit.

Fine grained schistose rocks known as phyllite occupy the Piedmont in Montgomery County west of a line running north-northeast from Blockhouse Point on the Potomac River to a point due north of Etchison

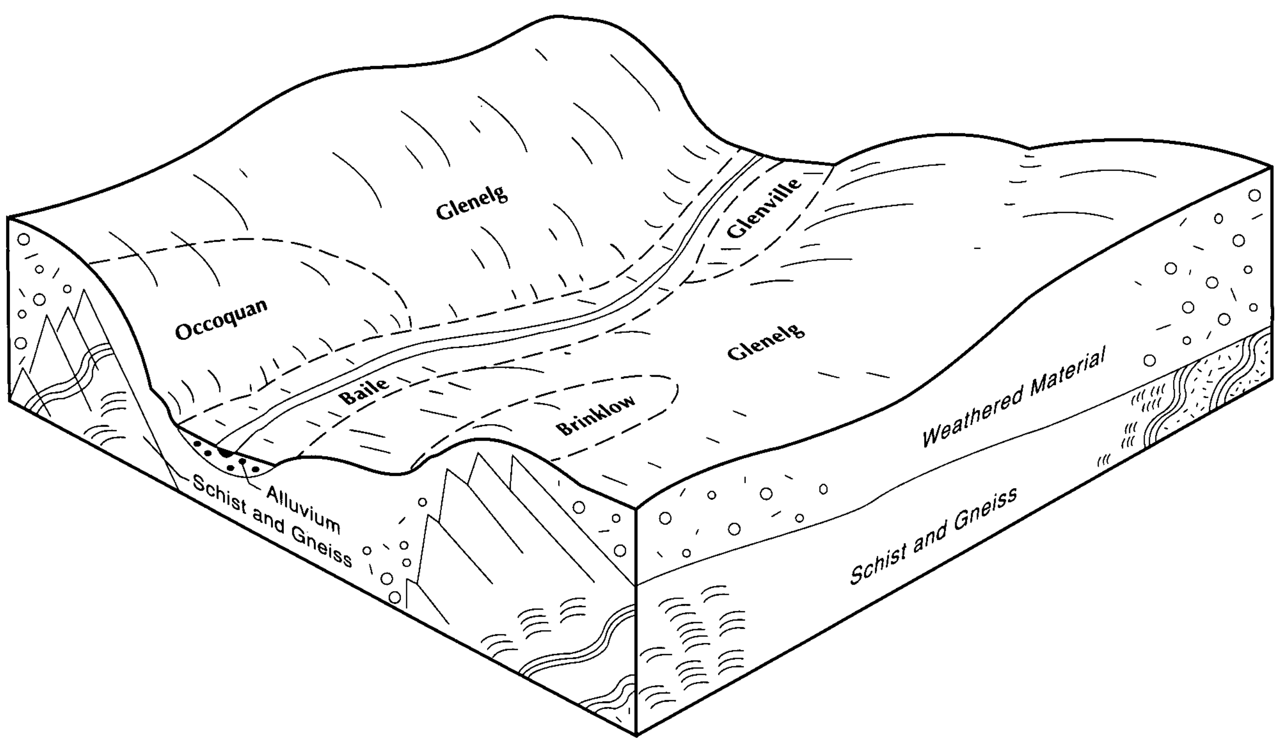

Figure 3.—Typical pattern of soils in the Piedmont physiographic province in Montgomery County.

along the Patuxent River at Annapolis Rock. These rocks are principally greenish gray, chlorite-muscovite phyllite with gray to purple phyllite and are characterized by a closely spaced, nearly vertical rock cleavage. Minor amounts of quartzite and metabasalt also are in this area. The major soils in this area are those in the Blocktown-Brinklow-Linganore general soil map unit. Blocktown and Brinklow soils formed in material weathered from both schist and phyllite bedrock.

In the eastern part of the county, the foliation of the schist dips steeply to the west. Throughout the central region the predominant direction of the dip is vertical. In the western part of the county, the dip is generally steep and to the east. Within each of these areas, however, there are significant local variations in the altitudes. The strike of the foliation is consistently north-south to northeast.

A large area in the western corner of the county is underlain by consolidated sedimentary rocks of Triassic age. This area is a small part of the Culpepper Basin in the neighboring State of Virginia. The basin is bounded on the west by a steep normal fault and has been filled with sandstone, siltstone, and shale that have a characteristic brick-red color. The beds in Montgomery County dip to the west at angles of 5 to 25 degrees. Locally, eastward dips are evident, presumably adjacent to minor faults within the basin. The strata also have been broken by several sets of nearly vertical joints. The soils in the Penn-Brentsville-Readington general soil map unit are dominant in this area.

Thin dikes of fine grained, black intrusive rock called diabase are in the western part of the Piedmont and intrude into all lithologies, including both the Triassic sedimentary rocks and the metamorphics. A large sill of coarser grained diabase is in a somewhat circular area of about 4 square miles south of Boyds and Bucklodge. Watchung soils is the dominant soils in this area.

Unconsolidated sedimentary rocks of Cretaceous age occur as erosional remnants on the hills along the Prince Georges County line. These are remnants of a once extensive layer of Coastal Plain deposits. Under favorable economic conditions, these unconsolidated deposits of sand and gravel have been mined. The major soils in this area are those in the Chillum-Croom-Beltsville general soil map unit.

Along the Potomac River, particularly on the wide bottoms in the area of Triassic rocks west of Seneca, is Recent alluvium consisting of gravel, sand, silt, and clay. This alluvial fill is much less well developed in areas where channels have been cut into hard, metamorphic rock. Examples of these areas are along the Potomac River east of Seneca, along the Patuxent River, and along the major tributary streams of those rivers. The dominant soils in these areas are Huntington, Lindside, and Bowmansville soils, which are of minor extent in the Penn-Brentsville-Readington general soil map unit.

A large remnant of a gravel terrace lies on Triassic bedrock between Martinsburg and Elmer in the extreme western part of the county. The pebbles were deposited by the Potomac River when it flowed at a higher level in late Tertiary or early Quaternary time, before eroding to its present channel. The deposit consists of large cobbles and pebbles with a matrix of sand and clay. Its composition is similar to that of the alluvial deposits of the present flood plain, but the material has been oxidized and decomposed because of long exposure to weathering. Smaller patches of this material are in areas to the south, along the bluffs overlooking the flood plain along the Potomac River (fig. 4). Other areas of this material are near the contact of the Triassic rocks with the Piedmont phyllites near Poolesville and Beallsville. Croom soils are typical of the soils that formed in this material. Bucks soils, which formed in material weathered from the underlying Triassic sedimentary bedrock, are interspersed in the area and are mapped with the Croom soils.

Transportation Facilities

A widely diverse transportation system serves the growing suburban and urban population in Montgomery County. It consists of an extensive network of interstate highways, State highways, county highways, arterial roads, and residential streets. This network is supplemented by a commuter subway line that runs through the District of Columbia and has two terminals in Montgomery County and by two bus systems.

Montgomery County has two airports for private planes and is near three major airports—National Airport, in the District of Columbia; Dulles Airport, in Virginia; and Baltimore-Washington International Airport, in Anne Arundel County, Maryland.

Future improvements in the transportation system will include a light rail transit system, high occupancy vehicle facilities, an intercounty connector, commuter parking lots, and two additional subway stations, in Forest Glen and Wheaton. The viability of a transit easement that will extend beyond Clarksburg is being studied.

Water Supply

Water is supplied to Montgomery County mainly by the Washington Suburban Sanitary Commission, an agency established by the Maryland General Assembly in 1918 to serve suburban Montgomery and Prince Georges Counties. The cities of Rockville and Poolesville have their own water supply.

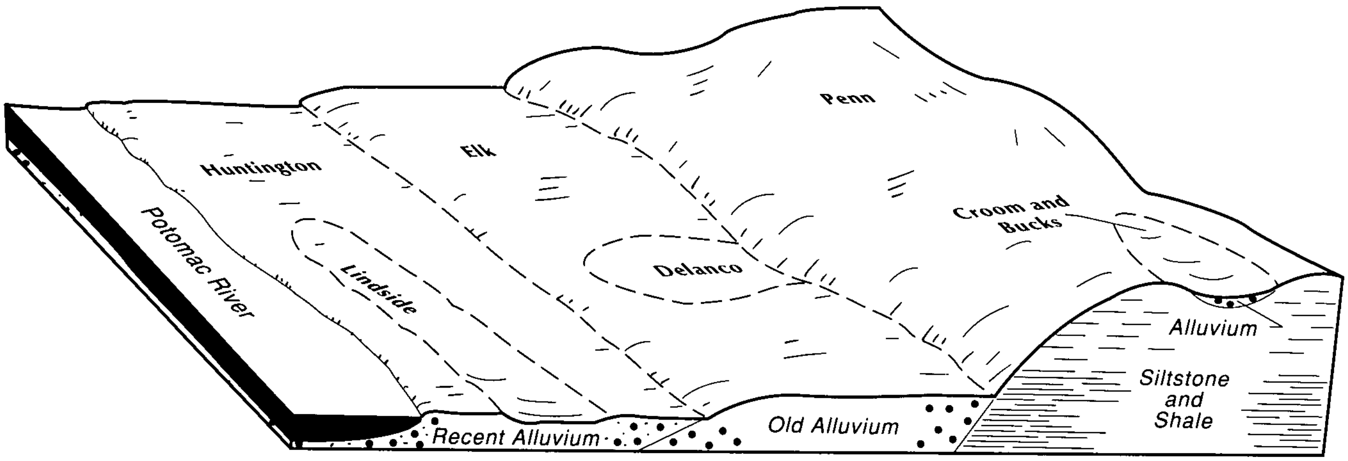

Figure 4.—Typical pattern of the soils in a Triassic bedrock area along the Potomac River.

The chief sources of water in the county are the Patuxent and Potomac Rivers. The Patuxent River supports two water-supply impoundment dams, one at Brighton, in Montgomery County, and one at Rocky Gorge in Laurel, in Prince Georges County. Together, these dams supply more than 11 billion gallons of water annually. The reservoir at Brighton is known as Triadelphia Lake. It has a storage capacity of 7 billion gallons. It is 5 miles long, has 800 acres of surface water, and has a watershed of 50,000 acres. The reservoir at Rocky Gorge has a storage capacity of 6.4 billion gallons and a watershed of 84,500 acres. The Potomac River supports one water-supply impoundment dam at Bloomington, in Montgomery County, known as the Bloomington Dam. This reservoir supplies more than 40 billion gallons annually and has a storage capacity of 30 billion gallons.

To ensure that water meets the standards required for public drinking water, the following treatment processes are performed: coagulation, flocculation, settling, chlorination, filtration, corrosion control, fluoridation, and pH adjustment. Immediately before the water enters the filtering plant, lime and a coagulating chemical, ferric chloride or aluminum sulfate, are added. The Patuxent Filtration Plant was built in four stages—the first in 1944, the second in 1951, and the last two in 1955. The Potomac Filtration Plant was built in 1961.

Two distribution systems supply water to Montgomery and Prince Georges Counties. Water supplied by the Patuxent Plant is forced by centrifugal pumps through a pipeline with a 42-inch diameter and a capacity of 46 million gallons a day. Water supplied by the Potomac Plant is delivered into two zones with a total capacity of 240 million gallons a day.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Rockville, Maryland, in the period 1951 to 1984. 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 35 degrees F and the average daily minimum temperature is 25 degrees. The lowest temperature on record, which occurred at Rockville on February 10, 1979, is -12 degrees. In summer, the average temperature is 74 degrees and the average daily maximum temperature is 86 degrees. The highest recorded temperature, which occurred on July 31, 1954, is 105 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 about 40 inches. Of this, more than 22 inches, or about 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 17 inches. The heaviest 1-day rainfall during the period of record was 7.9 inches at Rockville on June 22, 1972. Thunderstorms occur on about 28 days each year.

The average seasonal snowfall is about 17 inches. The greatest snow depth at any one time during the period of record was 27 inches. On the average, 8 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 75 percent. The sun shines 60 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the west-northwest. Average windspeed is highest, 11 miles per hour, in spring.

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 biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and 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 a considerable degree of 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, reaction, 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 interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are 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 are 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 predict with a fairly high degree of accuracy 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 two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

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

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

General Soil Map Units

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

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

Because of its small scale, the map can be used only for broad planning. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

Areas Dominated by Moderately Deep to Very Deep, Well Drained and Poorly Drained Soils Formed in Material Weathered from Schist and Gneiss; on Dissected Uplands

These soils make up about 73 percent of the county. The major soils are those of the Baile, Brinklow, Gaila, Glenelg, Occoquan, and Wheaton series. They are nearly level to moderately steep.

1. Glenelg-Gaila-Occoquan

Nearly level to strongly sloping, well drained, deep and very deep soils that are loamy throughout; on uplands

This unit is in the central part of the county. It extends east and south. It is on broad ridgetops and side slopes.

This unit makes up about 41 percent of the county. It is about 51 percent Glenelg soils, 21 percent Gaila soils, 7 percent Occoquan soils, and 21 percent soils of minor extent. The minor soils are Blocktown, Glenville, Elioak, and Montalto soils on uplands and Hatboro and Codorus soils along drainageways.

The nearly level to strongly sloping, very deep Glenelg soils are on broad ridgetops and side slopes. Typically, the surface layer is brown silt loam. The subsoil also is silt loam. It is strong brown in the upper part, yellowish red in the next part, and strong brown in the lower part. The substratum is yellowish red silt loam and loam.

The nearly level to strongly sloping, very deep Gaila soils are on broad ridgetops. Typically, the surface layer is brown silt loam. The subsoil is loam. It is strong brown in the upper part and yellowish brown in the lower part. The substratum is yellowish brown fine sandy loam.

The nearly level to strongly sloping, deep Occoquan soils are on broad ridgetops and side slopes. Typically, the surface layer is dark yellowish brown loam. The upper part of the subsoil is yellowish brown loam, and the lower part is strong brown fine sandy loam. The substratum is brownish yellow and strong brown fine sandy loam.

More than 60 percent of this unit is used for cultivated crops, hay, or pasture. The unit is well suited to these uses.

More than 70 percent of this unit has slight limitations if used for most kinds of urban development. The major limitations affecting onsite sewage disposal are restricted permeability and the depth to bedrock.

2. Brinklow-Baile-Occoquan

Nearly level to moderately steep, well drained and poorly drained, moderately deep to very deep soils that are loamy throughout; on uplands

This unit is in the northern part of the county. It is on broad ridgetops and side slopes.

This unit makes up about 16 percent of the county. It is about 38 percent Brinklow soils, 18 percent Baile soils, 14 percent Occoquan soils, and 30 percent soils of minor extent. The minor soils are Blocktown and Linganore soils on uplands and Hatboro and Codorus soils along drainageways.

The gently sloping to moderately steep, well drained, moderately deep Brinklow soils are on broad ridgetops and the upper parts of side slopes. Typically, the surface layer is brown channery silt loam. The upper part of the subsoil is strong brown channery silt loam, and the lower part is variegated strong brown, reddish yellow, and yellowish red channery loam. Below this is soft bedrock that crushes to very channery loam.

The nearly level, poorly drained, very deep Baile soils are in upland depressions and along small drainageways. Typically, the surface layer is very dark grayish brown silt loam. The upper part of the subsoil is gray silt loam that has yellowish red mottles, and the lower part is gray and dark gray loam that has yellowish brown mottles. The substratum is greenish gray loam that has yellowish brown mottles.

The gently sloping to strongly sloping, well drained, deep Occoquan soils are on broad ridgetops and side slopes. Typically, the surface layer is dark yellowish brown loam. The upper part of the subsoil is yellowish brown loam, and the lower part is strong brown fine sandy loam. The substratum is brownish yellow and strong brown fine sandy loam.

More than 60 percent of this unit is used for cultivated crops, hay, or pasture. The unit is well suited to these uses. The main limitations are the available water capacity and the slope. On more than 30 percent of the unit, the water table, the slope, or the depth to bedrock limits most agricultural uses.

On more than 40 percent of this unit, the water table, the slope, or the depth to bedrock limits urban uses. The major limitations affecting onsite sewage disposal are restricted permeability, the depth to bedrock, the water table, and the slope.

3. Urban land-Wheaton-Glenelg

Urban land and nearly level to strongly sloping, well drained, very deep soils that are loamy throughout; on uplands

This unit is in the Germantown area. It extends east and south to the county line. It is on broad ridgetops and side slopes.

This unit makes up about 16 percent of the county. It is about 40 percent Urban land, 18 percent Wheaton soils, 12 percent Glenelg soils, and 30 percent soils of minor extent. The minor soils are Conowingo, Travilah, Occoquan, and Neshaminy soils on uplands and Hatboro, Codorus, and Watchung soils along drainageways.

The nearly level to strongly sloping Wheaton soils are on broad ridgetops and side slopes. Typically, the surface layer is very dark grayish brown silt loam. The substratum is loam. It is strong brown and brown in the upper part and yellowish red in the lower part.

The nearly level to strongly sloping Glenelg soils are on broad ridgetops and side slopes. Typically, the surface layer is brown silt loam. The subsoil also is silt loam. It is strong brown in the upper part, yellowish red in the next part, and strong brown in the lower part. The substratum is yellowish red silt loam and loam.

More than 60 percent of this unit is used for urban development. The unit is well suited to urban uses. The major limitation affecting onsite sewage disposal is restricted permeability.

Areas Dominated by Moderately Deep and Deep, Well Drained and Moderately Well Drained Soils Formed in Material Weathered from Triassic Rocks; on Uplands

These soils make up about 14 percent of the county. The major soils are those of the Penn, Brentsville, and Readington series. They are nearly level to steep.

4. Penn-Brentsville-Readington

Nearly level to steep, well drained and moderately well drained, moderately deep and deep soils that are loamy throughout; on uplands

This unit is in the western part of the county. It is on broad ridgetops and side slopes.

This unit makes up about 14 percent of the county. It is about 46 percent Penn soils, 13 percent Brentsville soils, 11 percent Readington soils, and 30 percent soils of minor extent. The minor soils are Huntington, Lindside, and Bowmansville soils on flood plains; Bucks, Croton, and Nestoria soils on uplands; and Rowland soils along drainageways.

The nearly level to steep, well drained, moderately deep Penn soils are on broad ridgetops and side slopes. Typically, the surface layer is reddish brown silt loam. The upper part of the subsoil is dark red silt loam, and the lower part is reddish brown channery silt loam. Below this is soft bedrock that crushes to extremely channery silt loam.

The nearly level to strongly sloping, well drained, moderately deep Brentsville soils are on broad ridgetops and side slopes. Typically, the surface layer is reddish brown sandy loam. The subsoil also is sandy loam. It is yellowish red in the upper part and reddish brown in the lower part.

The nearly level and gently sloping, moderately well drained, deep Readington soils are on broad ridgetops. Typically, the surface layer is very dark grayish brown silt loam. The upper part of the subsoil is brown silty clay loam, the next part is yellowish red silty clay loam, and the lower part is red channery silt loam.

More than 70 percent of this unit is used as cropland or woodland. The unit is well suited to these uses. It generally is suited to most urban uses. The main limitation is the depth to bedrock. The major limitations affecting onsite sewage disposal are the depth to bedrock, the slope, and restricted permeability.

Areas Dominated by Shallow and Moderately Deep, Well Drained Soils Formed in Material Weathered from Phyllite, Schist, and Gneiss; on Highly Dissected Uplands

These soils make up about 10 percent of the county. The major soils are those of the Blocktown, Brinklow, and Linganore series. They are gently sloping to steep.

5. Blocktown-Brinklow-Linganore

Gently sloping to steep, well drained, shallow and moderately deep soils that are loamy throughout; on uplands

This unit is in the northern part of the county. It is on ridgetops and side slopes.

This unit makes up about 10 percent of the county. It is about 45 percent Blocktown soils, 10 percent Brinklow soils, 10 percent Linganore soils, and 35 percent soils or Rock outcrop of minor extent. The minor soils are Occoquan and Hyattstown soils in the uplands and Hatboro, Codorus, and Baile soils along drainageways. The Rock outcrop is in the uplands.

The gently sloping to steep, shallow Blocktown soils are on ridgetops and the upper parts of side slopes. Typically, the surface layer is yellowish red channery silt loam. The subsoil is red extremely channery silt loam. Below this is soft bedrock that crushes to extremely channery silt loam.

The gently sloping to moderately steep, moderately deep Brinklow soils are on ridgetops and side slopes. Typically, the surface layer is brown channery silt loam. The upper part of the subsoil is strong brown channery silt loam, and the lower part is variegated strong brown, reddish yellow, and yellowish red channery loam. Below this is soft bedrock that crushes to very channery loam.

The gently sloping to strongly sloping, moderately deep Linganore soils are on ridgetops and side slopes. Typically, the surface layer is dark grayish brown channery silt loam and dark brown very channery silt loam. The upper part of the subsoil is olive brown very channery silt loam, and the lower part is olive gray extremely channery silt loam. Below this is soft bedrock that crushes to extremely channery silt loam.

More than 60 percent of this unit is used as woodland or pasture. The unit is well suited to these uses. The depth to bedrock and the slope are the major limitations affecting cultivation.

This unit generally is poorly suited to most urban uses. The main limitations affecting onsite sewage disposal are the depth to bedrock and the slope.

Areas Dominated by Very Deep, Well Drained and Moderately Well Drained Soils Formed in Coastal Plain Sediments; on Uplands

These soils make up about 3 percent of the county. The major soils are those of the Chillum, Croom, and Beltsville series. They are nearly level to steep.

6. Chillum-Croom-Beltsville

Nearly level to steep, well drained and moderately well drained, very deep soils; on uplands

This unit is in the eastern part of the county, along the Prince Georges County line. It is on broad ridgetops and side slopes.

This unit makes up about 3 percent of the county. It is about 26 percent Chillum soils, 25 percent Croom soils, 14 percent Beltsville soils, and 35 percent soils of minor extent. The minor soils are Elsinboro soils on stream terraces, Evesboro and Sassafras soils on uplands, and Hatboro and Codorus soils along drainageways.

The nearly level to moderately steep, well drained Chillum soils are on broad ridgetops and side slopes. Typically, the surface layer is grayish brown and brown silt loam. The subsoil is yellowish brown silt loam. The substratum is strong brown very gravelly sandy loam.

The nearly level to steep, well drained Croom soils are on broad ridgetops and side slopes. Typically, the surface layer is brown gravelly loam. The subsurface layer is light yellowish brown gravelly loam. The upper part of the subsoil is yellowish brown very gravelly loam, and the lower part is strong brown very gravelly sandy loam. The substratum is reddish yellow very gravelly sandy loam and loamy sand.

The nearly level and gently sloping, moderately well drained Beltsville soils are on broad ridgetops. Typically, the surface layer is very dark gray silt loam. The subsurface layer is olive yellow silt loam. The subsoil is silty clay loam. In the upper part it is brownish yellow and has brown and red mottles, and in the lower part it is reddish yellow and has reddish yellow mottles. The substratum is clay loam. In the upper part it is reddish yellow and has light yellowish brown, reddish yellow, and white mottles, and in the lower part it is very pale brown and has reddish yellow and light gray mottles.

More than 70 percent of this unit is used as urban land or woodland. The unit is well suited to these uses. The main limitation affecting urban uses is a high water table in the Beltsville soils. The major limitations affecting onsite sewage disposal are the water table, restricted or rapid permeability, and the slope.

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

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

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Brinklow-Blocktown channery silt loams, 3 to 8 percent slopes, 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 the mapped areas 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. Chrome and Conowingo soils, 3 to 8 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. Urban land 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.

Soil Descriptions

1B—Gaila silt loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on broad ridgetops and side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 17 inches, strong brown loam
17 to 20 inches, yellowish brown loam

Substratum:
20 to 76 inches, yellowish brown fine sandy loam

Included with this soil in mapping are small areas of Occoquan and Brinklow soils on slightly convex slopes and Glenville soils on the concave lower parts of side slopes and near drainageways. Also included are Baile soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

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

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The capability subclass is IIe.

1C—Gaila silt loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 17 inches, strong brown loam
17 to 20 inches, yellowish brown loam

Substratum:
20 to 76 inches, yellowish brown fine sandy loam

Included with this soil in mapping are small areas of Occoquan and Brinklow soils on slightly convex slopes and Glenville soils on the concave lower parts of side slopes and near drainageways. Also included are Baile soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is suited to cultivated crops. The slope and a moderate hazard of erosion are the main management concerns. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope is the main limitation on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome this limitation.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The slope is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

2A—Glenelg silt loam, 0 to 3 percent slopes. This soil is very deep and well drained. It is on broad ridgetops and side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 12 inches, strong brown silt loam
12 to 16 inches, yellowish red silt loam
16 to 28 inches, strong brown silt loam

Substratum:
28 to 35 inches, yellowish red silt loam
35 to 60 inches, yellowish red loam

Included with this soil in mapping are small areas of Occoquan and Brinklow soils on convex crests and side slopes. Also included are Baile and Glenville soils in swales and along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

This soil is well suited to dwellings.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The moderate permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability class is I.

2B—Glenelg silt loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on broad ridgetops and side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from about 10 to 300 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 12 inches, strong brown silt loam
12 to 16 inches, yellowish red silt loam
16 to 28 inches, strong brown silt loam

Substratum:
28 to 35 inches, yellowish red silt loam
35 to 60 inches, yellowish red loam

Included with this soil in mapping are small areas of Occoquan and Brinklow soils on convex crests and side slopes. Also included are Baile and Glenville soils in swales and along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

This soil is well suited to dwellings.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The moderate permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

2C—Glenelg silt loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 12 inches, strong brown silt loam
12 to 16 inches, yellowish red silt loam
16 to 28 inches, strong brown silt loam

Substratum:
28 to 35 inches, yellowish red silt loam
35 to 60 inches, yellowish red loam

Included with this soil in mapping are small areas of Occoquan and Brinklow soils on convex crests and side slopes. Also included are Baile and Glenville soils in swales and along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Hazard of erosion: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

The slope is the main limitation on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome this limitation.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The moderate permeability and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

2UB—Glenelg-Urban land complex, 0 to 8 percent slopes. This unit consists of a very deep, well drained Glenelg soil intermingled with Urban land. Areas generally are irregularly shaped and are about 5 to 150 acres in size. They are about 50 percent Glenelg soil and 30 to 50 percent Urban land. The Glenelg soil and Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Glenelg soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 12 inches, strong brown silt loam
12 to 16 inches, yellowish red silt loam
16 to 28 inches, strong brown silt loam

Substratum:
28 to 35 inches, yellowish red silt loam
35 to 60 inches, yellowish red loam

Included in this unit in mapping are small areas of Glenville and Baile soils on the lower parts of the landscape. Some of these areas have been covered by fill. Also included are small, generally convex areas of soils that are moderately deep or shallow over bedrock and a few areas where bedrock is exposed. Included areas make up as much as 15 percent of the unit.

Properties of the Glenelg soil—

Permeability: Moderate
Available water capacity: High
Depth to bedrock: More than 5 feet
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have good potential for building site development and for lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetables gardens. Areas that have been very deeply excavated are generally droughty and thus have poor potential for most types of vegetation. The unit has only fair potential for most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

2UC—Glenelg-Urban land complex, 8 to 15 percent slopes. This unit consists of a very deep, well drained Glenelg soil intermingled with Urban land. Areas generally are irregularly shaped and are about 5 to 50 acres in size. They are about 50 percent Glenelg soil and 30 to 50 percent Urban land. The Glenelg soil and Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Glenelg soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 12 inches, strong brown silt loam
12 to 16 inches, yellowish red silt loam
16 to 28 inches, strong brown silt loam

Substratum:
28 to 35 inches, yellowish red silt loam
35 to 60 inches, yellowish red loam

Included in this unit in mapping are small areas of Glenville and Baile soils on the lower parts of the landscape. Some of these areas have been covered by fill. Also included are small, generally convex areas of soils that are moderately deep or shallow over bedrock and a few areas where bedrock is exposed. Included areas make up as much as 15 percent of the unit.

Properties of the Glenelg soil—

Permeability: Moderate
Available water capacity: High
Depth to bedrock: More than 5 feet
Hazard of erosion: Moderate
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have good potential for building site development and for lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetables gardens. Areas that have been very deeply excavated are generally droughty and thus have poor potential for most types of vegetation. The unit has only fair potential for most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

4B—Elioak silt loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on ridgetops and side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 6 inches, dark yellowish brown silt loam

Subsurface layer:
6 to 10 inches, yellowish brown silt loam

Subsoil:
10 to 15 inches, yellowish red silt loam
15 to 33 inches, red silty clay loam
33 to 42 inches, variegated red, yellowish red, and strong brown silty clay loam

Substratum:
42 to 60 inches, variegated yellowish red, red, weak red, and yellow silt loam

Included with this soil in mapping are small areas of Occoquan soils on slightly convex slopes. Also included are Glenville soils in low depressions. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops or for pasture. A few areas are wooded or are used for urban development. Woodland species include red oak and hickory.

This soil is well suited to cultivated crops. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

This soil is well suited to dwellings.

Low strength and the potential for frost action are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to overcome these limitations.

The moderate permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

4C—Elioak silt loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 6 inches, dark yellowish brown silt loam

Subsurface layer:
6 to 10 inches, yellowish brown silt loam

Subsoil:
10 to 15 inches, yellowish red silt loam
15 to 33 inches, red silty clay loam
33 to 42 inches, variegated red, yellowish red, and strong brown silty clay loam

Substratum:
42 to 60 inches, variegated yellowish red, red, weak red, and yellow silt loam

Included with this soil in mapping are small areas of Occoquan soils on slightly convex slopes. Also included are Glenville soils in low depressions. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Hazard of erosion: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops or for pasture. A few areas are wooded or are used for urban development.

This soil is suited to cultivated crops. Erosion is the main hazard. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope is the main limitation on sites for dwellings. Land shaping and designing the buildings so that they conform to the natural slope of the land help to overcome this limitation.

Low strength, the potential for frost action, the shrink-swell potential, and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by low strength, frost action, and shrinking and swelling. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The moderate permeability and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

5A—Glenville silt loam, 0 to 3 percent slopes. This soil is very deep and is moderately well drained or somewhat poorly drained. It is in low areas on uplands and along drainageways. Slopes generally are smooth. Areas range from 2 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, dark brown silt loam

Subsoil:
8 to 20 inches, yellowish brown gravelly silt loam that has grayish brown mottles
20 to 30 inches, brownish yellow silt loam that has strong brown and grayish brown mottles
30 to 40 inches, yellowish brown loam that has grayish brown faces of peds and yellowish red and pale brown mottles
40 to 59 inches, variegated strong brown, light gray,

and light yellowish brown fine sandy loam
59 to 70 inches, variegated brownish yellow, very pale brown, and reddish yellow sandy loam

Included with this soil in mapping are the poorly drained Baile soils in the slightly lower areas, especially adjacent to streams. Also included are Glenelg soils near the edges of the map unit. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Slow
Available water capacity: Moderate
Water table: At a depth of 6 to 36 inches in late winter and early spring
Potential for frost action: High

Most areas are used for cultivated crops, pasture, or woodland. A few drained areas are used for urban development.

This soil is suited to cultivated crops. The high water table and the slow permeability are the main limitations. Excess water delays plowing and causes the soil to warm slowly in spring. The crops can be damaged by ponding after periods of heavy rainfall. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concerns are the high water table and the slow permeability, which result in seedling mortality and windthrow and limit the use of equipment. The trees should not be harvested during wet periods.

The high water table is the main limitation on sites for dwellings. The better suited soils on uplands should be selected.

The high water table and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads on raised fill material and installing a drainage system can increase the depth to the water table. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage caused by frost action.

The high water table and the slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIw.

5B—Glenville silt loam, 3 to 8 percent slopes. This soil is very deep and is moderately well drained or somewhat poorly drained. It is in low areas on uplands and along drainageways. Slopes generally are smooth. Areas range from 2 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, dark brown silt loam

Subsoil:
8 to 20 inches, yellowish brown gravelly silt loam that has grayish brown mottles
20 to 30 inches, brownish yellow silt loam that has strong brown and light brownish gray mottles
30 to 40 inches, yellowish brown loam that has grayish brown faces of peds and yellowish red and pale brown mottles
40 to 59 inches, variegated strong brown, light gray, and light yellowish brown fine sandy loam
59 to 70 inches, variegated brownish yellow, very pale brown, and reddish yellow sandy loam

Included with this soil in mapping are the poorly drained Baile soils in the slightly lower areas, especially adjacent to streams. Also included are Glenelg soils near the edges of the map unit. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Slow
Available water capacity: Moderate
Water table: At a depth of 6 to 36 inches in late winter and early spring
Potential for frost action: High

Most areas are used for cultivated crops, pasture, or woodland. A few drained areas are used for urban development.

This soil is suited to cultivated crops. The high water table and the slow permeability are the main limitations. Excess water delays plowing and causes the soil to warm slowly in spring. The crops can be damaged by ponding after periods of heavy rainfall. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concerns are the high water table and the slow permeability, which result in seedling mortality and windthrow and limit the use of equipment. The trees should not be harvested during wet periods.

The high water table is the main limitation on sites for dwellings. The better suited soils on uplands should be selected.

The high water table and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads on raised fill material and installing a drainage system can increase the depth to the water table. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage caused by frost action.

The high water table and the slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

6A—Baile silt loam, 0 to 3 percent slopes. This soil is very deep and poorly drained. It is in upland depressions and along drainageways (fig. 5). Areas range from 3 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
- 0 to 8 inches, very dark grayish brown silt loam

Subsoil:
- 8 to 31 inches, gray silt loam that has yellowish red mottles
- 31 to 40 inches, gray and dark gray loam that has yellowish brown mottles

Substratum:
- 40 to 62 inches, greenish gray loam that has yellowish brown mottles

Included with this soil in mapping are Glenville soils in the slightly higher areas. Also included are soils that are very gravelly below a depth of 40 inches. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Slow
Available water capacity: High
Water table: Within a depth of 6 inches from winter to spring
Potential for frost action: High

Most areas are used as woodland or pasture. A few areas are used for hay. Woodland species include willow, red maple, and pin oak.

Because of the high water table, this soil is generally unsuited to most cultivated crops. Excess water delays plowing and causes the soil to warm slowly in spring. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to pasture. The major management concerns are restricting grazing when the soil is wet and selecting water-tolerant species for planting. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concern is the high water table, which can result in seedling mortality and can limit the use of equipment. The trees should not be harvested during wet periods.

The high water table is the main limitation on sites for dwellings. The better suited soils on uplands should be selected.

The high water table and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads on raised fill material and installing a drainage system can increase the depth to the water table. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage caused by frost action.

The high water table and the slow permeability are the main limitations on sites for septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is Vw.

Figure 5.—An area of Baile silt loam, 0 to 3 percent slopes. Cattails and soft rush are typical wetland plants in this area.

7UB—Gaila-Urban land complex, 0 to 8 percent slopes. This unit consists of a very deep, well drained Gaila soil intermingled with Urban land. Areas generally are irregularly shaped and are about 5 to 50 acres in size. They are about 50 percent Gaila soil and 30 to 50 percent Urban land. The Gaila soil and Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Gaila soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 17 inches, strong brown loam
17 to 20 inches, yellowish brown loam
20 to 76 inches, yellowish brown fine sandy loam

Included in this unit in mapping are small areas of Glenville and Baile soils on the lower parts of the landscape. Some of these areas have been covered by fill. Also included are small, generally convex areas of soils that are moderately deep or shallow over bedrock and a few areas where bedrock is exposed. Included areas make up as much as 15 percent of the unit.

Properties of the Gaila soil—

Permeability: Moderate
Available water capacity: Moderate
Depth to bedrock: More than 5 feet
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have good potential for building site development and for lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetables gardens. Areas that are very deeply cut are generally droughty and thus have poor potential for most types of vegetation. The unit has only fair potential for most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

7UC—Gaila-Urban land complex, 8 to 15 percent slopes. This unit consists of a very deep, well drained Gaila soil intermingled with Urban land. Areas generally are irregularly shaped and are about 5 to 50 acres in size. They are about 50 percent Gaila soil and 30 to 50 percent Urban land. The Gaila soil and Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Gaila soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 17 inches, strong brown loam
17 to 20 inches, yellowish brown loam
20 to 76 inches, yellowish brown fine sandy loam

Included in this unit in mapping are small areas of Glenville and Baile soils on the lower parts of the landscape. Some of these areas have been covered by fill. Also included are small, generally convex areas of soils that are moderately deep or shallow over bedrock and a few areas where bedrock is exposed. Included areas make up as much as 15 percent of the unit.

Properties of the Gaila soil—

Permeability: Moderate
Available water capacity: Moderate
Depth to bedrock: More than 5 feet
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have good potential for building site development and for lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetables gardens. Areas that have been very deeply excavated are generally droughty and thus have poor potential for most types of vegetation. The unit has only fair potential for most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

9B—Linganore-Hyattstown channery silt loams, 3 to 8 percent slopes. These well drained, gently sloping soils are on broad ridgetops and side slopes. The Linganore soil generally is slightly lower on the landscape than the Hyattstown soil. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 150 acres in size. They are about 50 percent moderately deep Linganore soil, 30 percent shallow Hyattstown soil, and 20 percent other soils. The Linganore and Hyattstown soils occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Linganore soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown channery silt loam

Substratum:
4 to 11 inches, dark brown very channery silt loam

Subsoil:
11 to 17 inches, olive brown very channery silt loam
17 to 22 inches, olive gray extremely channery silt loam

Bedrock:
22 to 51 inches, grayish brown, soft bedrock that crushes to extremely channery silt loam
51 inches, hard phyllite

The typical sequence, depth, and composition of the layers in the Hyattstown soil are as follows—

Surface layer:
0 to 9 inches, dark grayish brown channery silt loam

Subsoil:
9 to 14 inches, yellowish brown very channery silt loam
14 to 18 inches, brown extremely channery silt loam

Bedrock:
18 to 26 inches, weathered phyllite that crushes to extremely channery clay loam
26 inches, hard phyllite

Included with these soils in mapping are Occoquan soils on the lower side slopes. Also included are Baile soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the Linganore soil; moderate in the Hyattstown soil
Available water capacity: Very low
Depth to bedrock: 20 to 40 inches in the Linganore soil; 10 to 20 inches in the Hyattstown soil
Potential for frost action: Moderate

Most areas are used for cultivated crops or for hay or pasture.

These soils are suited to cultivated crops. The main limitation is the very low available water capacity. Erosion is a hazard. Excessive erosion decreases the rooting depth and further lowers soil productivity. Most crops show some evidence of moisture stress during dry periods. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

These soils are well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderately high. Seedling mortality is a moderate hazard because of the very low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The hazard of windthrow is severe on the Hyattstown soil. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce this hazard.

The depth to bedrock is the main limitation on sites for dwellings, especially those with basements. Where weathered, the bedrock can be ripped by heavy equipment.

The potential for frost action and the depth to bedrock are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage caused by frost action. Bedrock generally will be encountered during grading and land shaping. Where weathered, the bedrock can be ripped by heavy machinery.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe in areas of the Linganore soil and IIIs in areas of the Hyattstown soil.

9C—Linganore-Hyattstown channery silt loams, 8 to 15 percent slopes. These well drained, strongly sloping soils are on broad ridgetops and side slopes. The Linganore soil generally is slightly lower on the landscape than the Hyattstown soil (fig. 6). Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 150 acres in size. They are about 50 percent moderately deep Linganore soil, 30 percent shallow Hyattstown soil, and 20 percent other soils. The Linganore and Hyattstown soils occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Linganore soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown channery silt loam

Substratum:
4 to 11 inches, dark brown very channery silt loam

Subsoil:
11 to 17 inches, olive brown very channery silt loam
17 to 22 inches, olive gray extremely channery silt loam

Bedrock:
22 to 51 inches, grayish brown, soft bedrock that crushes to extremely channery silt loam
51 inches, hard phyllite

The typical sequence, depth, and composition of the layers in the Hyattstown soil are as follows—

Surface layer:
0 to 9 inches, dark grayish brown channery silt loam

Subsoil:
9 to 14 inches, yellowish brown very channery silt loam
14 to 18 inches, brown extremely channery silt loam

Bedrock:
18 to 26 inches, weathered phyllite that crushes to extremely channery clay loam
26 inches, hard phyllite

Included with these soils in mapping are Occoquan soils on the lower side slopes. Also included are Baile soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the Linganore soil; moderate in the Hyattstown soil
Available water capacity: Very low
Hazard of erosion: Moderate
Depth to bedrock: 20 to 40 inches in the Linganore soil; 10 to 20 inches in the Hyattstown soil
Potential for frost action: Moderate

Most areas are used for cultivated crops or for hay or pasture.

Figure 6.—An area of Linganore-Hyattstown channery silt loams, 8 to 15 percent slopes. The Hyattstown soil is along the crest of the ridges, and the Linganore soil is on the side slopes.

These soils are suited to cultivated crops. The main management concerns are the moderate hazard of erosion and the very low available water capacity. Excessive erosion decreases the rooting depth and further lowers soil productivity. Most crops show some evidence of moisture stress during dry periods. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

These soils are well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderately high. Seedling mortality is a moderate hazard because of the very low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The hazard of windthrow is severe on the Hyattstown soil. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce this hazard.

The depth to bedrock and the slope are the main limitations on sites for dwellings, especially those with basements. Where weathered, the bedrock can be ripped by heavy equipment. Designing the buildings so that they conform to the natural slope of the land and land shaping help to overcome the slope.

The potential for frost action, the depth to bedrock, and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage caused by frost action. Bedrock generally will be encountered during grading and land shaping. Where weathered, the bedrock can be ripped by heavy machinery. Land shaping and grading and constructing the roads on the contour help to overcome the slope.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IVe in areas of the Linganore soil and IIIe in areas of the Hyattstown soil.

16B—Brinklow-Blocktown channery silt loams, 3 to 8 percent slopes. These well drained, gently sloping soils are on broad ridgetops and side slopes. The Brinklow soil generally is slightly lower on the landscape than the Blocktown soil. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 150 acres in size. They are about 50 percent moderately deep Brinklow soil, 30 percent shallow Blocktown soil, and 20 percent other soils. The Brinklow and Blocktown soils occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Brinklow soil are as follows—

Surface layer:
0 to 10 inches, brown channery silt loam

Subsoil:
10 to 19 inches, strong brown channery silt loam
19 to 25 inches, variegated strong brown, reddish yellow, and yellowish red channery loam

Bedrock:
25 to 35 inches, reddish yellow, soft bedrock that crushes to very channery loam
35 inches, hard phyllite

The typical sequence, depth, and composition of the layers in the Blocktown soil are as follows—

Surface layer:
0 to 6 inches, yellowish red channery silt loam

Subsoil:
6 to 17 inches, red extremely channery silt loam

Bedrock:
17 to 21 inches, variegated red and yellowish red, soft bedrock that crushes to extremely channery silt loam
21 inches, hard phyllite

Included with these soils in mapping are Glenelg and Occoquan soils on the lower parts of side slopes. Also included are Baile and Glenville soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the Brinklow soil; moderate in the Blocktown soil
Available water capacity: Low in the Brinklow soil; very low in the Blocktown soil
Depth to bedrock: 20 to 40 inches in the Brinklow soil; 10 to 20 inches in the Blocktown soil
Hazard of erosion: Slight

Most areas are used for cultivated crops or for hay or pasture.

These soils are suited to cultivated crops. The main limitation is the very low available water capacity in the Blocktown soil. Excessive erosion decreases the rooting depth and further lowers soil productivity. Most crops show some evidence of moisture stress during dry periods. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface can help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

These soils are well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderately high. Seedling mortality is a moderate hazard on the Blocktown soil because of the very low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The hazard of windthrow is severe on the Blocktown soil. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce this hazard.

The depth to bedrock is the main limitation on sites for dwellings, especially those with basements. Where weathered, the bedrock can be ripped by heavy equipment.

The depth to bedrock is the main limitation on sites for local roads and streets. Bedrock generally will be encountered during grading and land shaping. Where weathered, the bedrock can be ripped by heavy machinery.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe in areas of the Brinklow soil and IIIs in areas of the Blocktown soil.

16C—Brinklow-Blocktown channery silt loams, 8 to 15 percent slopes. These well drained, strongly sloping soils are on broad ridgetops and side slopes. The Brinklow soil generally is slightly lower on the landscape than the Blocktown soil. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 100 acres in size. They are about 50 percent moderately deep Brinklow soil, 30 percent shallow Blocktown soil, and 20 percent other soils. The Brinklow and Blocktown soils occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Brinklow soil are as follows—

Surface layer:
0 to 10 inches, brown channery silt loam

Subsoil:
10 to 19 inches, strong brown channery silt loam
19 to 25 inches, variegated strong brown, reddish yellow, and yellowish red channery loam

Bedrock:
25 to 35 inches, reddish yellow, soft bedrock that crushes to very channery loam
35 inches, hard phyllite

The typical sequence, depth, and composition of the layers in the Blocktown soil are as follows—

Surface layer:
0 to 6 inches, yellowish red channery silt loam

Subsoil:
6 to 17 inches, red extremely channery silt loam

Bedrock:
17 to 21 inches, variegated red and yellowish red, soft bedrock that crushes to extremely channery silt loam
21 inches, hard phyllite

Included with these soils in mapping are Glenelg and Occoquan soils on the lower parts of side slopes. Also included are Baile and Glenville soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the Brinklow soil; moderate in the Blocktown soil
Available water capacity: Low in the Brinklow soil; very low in the Blocktown soil
Depth to bedrock: 20 to 40 inches in the Brinklow soil; 10 to 20 inches in the Blocktown soil
Hazard of erosion: Moderate

Most areas are used for cultivated crops or for hay or pasture.

These soils are suited to cultivated crops. The main management concerns are the moderate hazard of erosion and the very low available water capacity in the Blocktown soil. Excessive erosion decreases the rooting depth and further lowers soil productivity. Most crops show some evidence of moisture stress during dry periods. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

These soils are well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderately high. Seedling mortality is a moderate hazard on the Blocktown soil because of very low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The hazard of windthrow is severe on the Blocktown soil. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce this hazard.

The depth to bedrock and the slope are the main limitations on sites for dwellings, especially those with basements. Where weathered, the bedrock can be ripped by heavy equipment. Designing the buildings so that they conform to the natural slope of the land and land shaping help to overcome the slope.

The depth to bedrock and the slope are the main limitations on sites for local roads and streets. Bedrock generally will be encountered during grading and land shaping. Where weathered, the bedrock can be ripped by machinery. Land shaping and grading and constructing the roads on the contour help to overcome the slope.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

16D—Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes. These well drained, moderately steep soils are on side slopes in the uplands. The Brinklow soil generally is slightly lower on the landscape than the Blocktown soil. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 75 acres in size. They are about 50 percent moderately deep Brinklow soil, 30 percent shallow Blocktown soil, and 20 percent other soils. The Brinklow and Blocktown soils occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Brinklow soil are as follows—

Surface layer:
0 to 10 inches, brown channery silt loam

Subsoil:
10 to 19 inches, strong brown channery silt loam
19 to 25 inches, variegated strong brown, reddish yellow, and yellowish red channery loam

Bedrock:
25 to 35 inches, reddish yellow, soft bedrock that crushes to very channery loam
35 inches, hard phyllite

The typical sequence, depth, and composition of the layers in the Blocktown soil are as follows—

Surface layer:
0 to 6 inches, yellowish red channery silt loam

Subsoil:
6 to 17 inches, red extremely channery silt loam

Bedrock:
17 to 21 inches, variegated red and yellowish red, soft bedrock that crushes to extremely channery silt loam
21 inches, hard phyllite

Included with these soils in mapping are Glenelg and Occoquan soils on the lower parts of side slopes. Also included are Baile soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the Brinklow soil; moderate in the Blocktown soil
Available water capacity: Low in the Brinklow soil; very low in the Blocktown soil
Depth to bedrock: 20 to 40 inches in the Brinklow soil; 10 to 20 inches in the Blocktown soil
Hazard of erosion: Severe

Most areas are used for woodland, cultivated crops, or hay or pasture. Woodland species include red oak and chestnut oak.

These soils are poorly suited to cultivated crops. The main management concerns are the severe hazard of erosion and the very low available water capacity in the Blocktown soil. Excessive erosion decreases the rooting depth and further lowers soil productivity. Most crops show some evidence of moisture stress during dry periods. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

These soils are suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderately high. The main management concerns are a moderate hazard of erosion and an equipment limitation, which are caused by the slope. On the Blocktown soil, the hazard of seedling mortality is moderate and the hazard of windthrow is severe. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The hazard of windthrow can be reduced through the use of special equipment that does not damage surficial root systems during selective cutting operations.

The depth to bedrock and the slope are the main limitations on sites for dwellings, especially those with basements. Where weathered, the bedrock can be ripped by heavy equipment. Designing the buildings so that they conform to the natural slope of the land and land shaping help to overcome the slope.

The depth to bedrock and the slope are the main limitations on sites for local roads and streets. Bedrock generally will be encountered during grading and land shaping. Where weathered, the bedrock can be ripped by machinery. Land shaping and grading and constructing the roads on the contour help to overcome the slope.

The depth to bedrock and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IVe.

17B—Occoquan loam, 3 to 8 percent slopes. This soil is deep and well drained. It is on broad ridgetops and side slopes. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 120 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, dark yellowish brown loam

Subsoil:
8 to 15 inches, yellowish brown loam
15 to 24 inches, strong brown fine sandy loam

Substratum:
24 to 59 inches, brownish yellow and strong brown fine sandy loam

Bedrock:
59 inches, fractured, weathered schist

Included with this soil in mapping are small areas of Brinklow soils on ridges and side slopes and Glenelg soils on slightly concave side slopes. Also included are Baile soils along drainageways. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Depth to bedrock: 40 to 60 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops or for hay or pasture. A few areas are used for urban development.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate.

This soil is well suited to dwellings.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

17C—Occoquan loam, 8 to 15 percent slopes. This soil is deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 120 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, dark yellowish brown loam

Subsoil:
8 to 15 inches, yellowish brown loam
15 to 24 inches, strong brown fine sandy loam

Substratum:
24 to 59 inches, brownish yellow and strong brown fine sandy loam

Bedrock:
59 inches, fractured, weathered schist

Included with this soil in mapping are small areas of Brinklow soils on convex side slopes and Glenelg soils on slightly concave side slopes. Also included are Baile soils along drainageways. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Depth to bedrock: 40 to 60 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops (fig. 7) or for hay or pasture. A few areas are used for urban development.

This soil is suited to cultivated crops. The slope and a moderate hazard of erosion are the main management concerns. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate.

The slope is the main limitation on sites for dwellings with basements. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome the slope.

Figure 7.—Contour stripcropping in an area of Occoquan loam, 8 to 15 percent slopes.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The depth to bedrock and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IVe.

18C—Penn silt loam, 8 to 15 percent slopes, very stony. This soil is moderately deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 50 acres in size. Stones cover 0.1 to 3.0 percent of the surface.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, reddish brown silt loam

Subsoil:
9 to 16 inches, dark red silt loam
16 to 21 inches, reddish brown channery silt loam
21 to 36 inches, weak red extremely channery silt loam

Bedrock:
36 inches, soft siltstone

Included with this soil in mapping are small areas of Bucks soils on the slightly concave lower parts of side slopes. Also included are small areas of Nestoria soils on slightly convex slopes and areas of moderately deep, poorly drained soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Hazard of erosion: Moderate
Potential for frost action: Moderate

Most areas are used as woodland. A few areas are used as pasture. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil generally is poorly suited to cultivated crops and hay. In isolated areas that are free of stones, it is suited to cultivated crops, but few of these areas can be economically farmed.

This soil is suited to pasture renovation. In areas that are free of stones, it is well suited to pasture. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The surface stones limit the use of equipment.

The depth to bedrock and the slope are the main limitations on sites for dwellings with basements. The weathered bedrock can be ripped. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome the slope.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is VIs.

18E—Penn silt loam, 15 to 45 percent slopes, very stony. This soil is moderately deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 30 acres in size. Stones cover 0.1 to 3.0 percent of the surface.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, reddish brown silt loam

Subsoil:
9 to 16 inches, dark red silt loam
16 to 21 inches, reddish brown channery silt loam
21 to 36 inches, weak red extremely channery silt loam

Bedrock:
36 inches, soft siltstone

Included with this soil in mapping are small areas of Bucks soils on the lower, slightly concave side slopes. Also included are small areas of Nestoria soils on slightly convex slopes and areas of moderately deep, poorly drained soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Hazard of erosion: Severe
Potential for frost action: Moderate

Most areas are used as woodland. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil is generally unsuited to cultivated crops and to hay and pasture. The slope, the surface stones, and the severe hazard of erosion are the main management concerns.

The potential productivity for trees on this soil is moderate. The main management concerns are the severe hazard of erosion and an equipment limitation, which are caused by the surface stones and the slope. The proper construction and maintenance of roads, trails, landings, and fire lanes can reduce the hazard of erosion.

This soil is generally unsuited to dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The slope is the main limitation on sites for local roads and streets. Constructing the roads on the contour and land shaping and grading help to overcome this limitation.

The capability subclass is VIIs.

19A—Bucks silt loam, 0 to 3 percent slopes. This soil is deep or very deep and is well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 70 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 12 inches, dark reddish brown silt loam

Subsoil:
12 to 33 inches, reddish brown silt loam

Substratum:
33 to 45 inches, reddish brown channery silt loam

Bedrock:
45 inches, dusky red, fractured shale

Included with this soil in mapping are small areas of Penn soils, generally on the higher parts of the landscape, and small areas of very deep soils on the lower parts of side slopes. Also included are small areas of Readington and Croton soils. Readington are in low areas, and Croton soils are along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. It can be easily managed and can be cultivated without the risk of damage if the best management is applied. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

The moderate shrink-swell potential is the main limitation on sites for dwellings. Providing coarse grained base material and adding extra reinforcement in footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The moderate shrink-swell potential and the potential for frost action are the main limitations on sites for local roads and streets. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by frost action.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability class is I.

19B—Bucks silt loam, 3 to 8 percent slopes. This soil is deep or very deep and is well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 80 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 12 inches, dark reddish brown silt loam

Subsoil:
12 to 33 inches, reddish brown silt loam

Substratum:
33 to 45 inches, reddish brown channery silt loam

Bedrock:
45 inches, dusky red, fractured shale

Included with this soil in mapping are small areas of Penn soils, generally on the higher parts of the landscape, and small areas of very deep soils on the lower parts of side slopes. Also included are small areas of Readington and Croton soils. Readington soils are in low areas, and Croton soils are along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

The moderate shrink-swell potential is the main limitation on sites for dwellings. Providing coarse grained base material and adding extra reinforcement in footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The moderate shrink-swell potential and the potential for frost action are the main limitations on sites for local roads and streets. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by frost action.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

20A—Brentsville sandy loam, 0 to 3 percent slopes. This soil is moderately deep and well drained. It is on broad uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 10 inches, reddish brown sandy loam

Subsoil:
10 to 21 inches, yellowish red sandy loam
21 to 33 inches, reddish brown sandy loam

Bedrock:
33 inches, fractured Triassic sandstone

Included with this soil in mapping are small areas of Penn and Bucks soils on the lower parts of the landscape. Also included are small areas of Readington soils in depressions. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops or are wooded. A few areas are used for hay or pasture or for urban development. Woodland species include red oak and white oak.

This soil is well suited to cultivated crops. The crops respond well to applications of fertilizer and good management. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The depth to bedrock is the main limitation on sites for dwellings with basements. Using heavy equipment to excavate the bedrock, building above the bedrock, and landscaping with additional fill help to overcome this limitation.

The potential for frost action and the depth to bedrock are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by the frost action.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIs.

20B—Brentsville sandy loam, 3 to 8 percent slopes. This soil is moderately deep and well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 10 inches, reddish brown sandy loam

Subsoil:
10 to 21 inches, yellowish red sandy loam
21 to 33 inches, reddish brown sandy loam

Bedrock:
33 inches, fractured Triassic sandstone

Included with this soil in mapping are small areas of Penn and Bucks soils on the lower parts of the landscape. Also included are small areas of Readington soils in depressions. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops or are wooded. A few areas are used for hay or pasture or for urban development.

This soil is suited to cultivated crops. The crops respond well to applications of fertilizer and good management. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The depth to bedrock is the main limitation on sites for dwellings with basements. Using heavy equipment to excavate the bedrock, building above the bedrock, and landscaping with additional fill help to overcome this limitation.

The potential for frost action and the depth to bedrock are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

20C—Brentsville sandy loam, 8 to 15 percent slopes. This soil is moderately deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 10 inches, reddish brown sandy loam

Subsoil:
10 to 21 inches, yellowish red sandy loam
21 to 33 inches, reddish brown sandy loam

Bedrock:
33 inches, fractured Triassic sandstone

Included with this soil in mapping are small areas of Penn and Bucks soils on the lower parts of side slopes. Also included are small areas of Readington soils in depressions. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Hazard of erosion: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops or are wooded. A few areas are used for hay or pasture or for urban development. Woodland species include red oak and white oak.

This soil is suited to cultivated crops. The crops respond well to applications of fertilizer and good management. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The depth to bedrock is the main limitation on sites for dwellings with basements. Using heavy equipment to excavate the bedrock, building above the bedrock, and landscaping with additional fill help to overcome this limitation.

The potential for frost action and the depth to bedrock are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

21A—Penn silt loam, 0 to 3 percent slopes. This soil is moderately deep and well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from about 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, reddish brown silt loam

Subsoil:
9 to 16 inches, dark red silt loam
16 to 21 inches, reddish brown channery silt loam
21 to 36 inches, weak red extremely channery silt loam

Bedrock:
36 inches, soft siltstone

Included with this soil in mapping are small areas of Bucks and Brentsville soils on the lower parts of the landscape. Also included are small areas of Nestoria soils on slightly convex uplands and areas of moderately deep, poorly drained soils along drainageways. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops or are wooded. A few areas are used for hay or pasture or for urban development. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil is well suited to cultivated crops. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The depth to bedrock is the main limitation on sites for dwellings with basements. The weathered bedrock can be ripped.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIs.

21B—Penn silt loam, 3 to 8 percent slopes. This soil is moderately deep and well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from about 5 to 200 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, reddish brown silt loam

Subsoil:
9 to 16 inches, dark red silt loam
16 to 21 inches, reddish brown channery silt loam
21 to 36 inches, weak red extremely channery silt loam

Bedrock:
36 inches, soft siltstone

Included with this soil in mapping are small areas of Bucks and Brentsville soils on the lower parts of the landscape. Also included are small areas of Nestoria soils on slightly convex uplands and areas of moderately deep, poorly drained soils along drainageways. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops or are wooded. A few areas are used for hay or pasture or for urban development. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil is well suited to cultivated crops. The slope is the main management concern. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The depth to bedrock is the main limitation on sites for dwellings with basements. The weathered bedrock can be ripped.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

21C—Penn silt loam, 8 to 15 percent slopes. This soil is moderately deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from about 5 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, reddish brown silt loam

Subsoil:
9 to 16 inches, dark red silt loam
16 to 21 inches, reddish brown channery silt loam
21 to 36 inches, weak red extremely channery silt loam

Bedrock:
36 inches, soft siltstone

Included with this soil in mapping are small areas of Bucks and Brentsville soils on the lower parts of the landscape. Also included are small areas of Nestoria soils on slightly convex uplands and areas of moderately deep, poorly drained soils along drainageways. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Hazard of erosion: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops or are wooded. A few areas are used for hay or pasture or for urban development. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil is suited to cultivated crops. The moderate hazard of erosion is the main management concern. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The depth to bedrock and the slope are the main limitations on sites for dwellings with basements. The weathered bedrock can be ripped. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome the slope.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

21D—Penn silt loam, 15 to 25 percent slopes. This soil is moderately deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from about 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, reddish brown silt loam

Subsoil:
9 to 16 inches, dark red silt loam
16 to 21 inches, reddish brown channery silt loam
21 to 36 inches, weak red extremely channery silt loam

Bedrock:
36 inches, soft siltstone

Included with this soil in mapping are small areas of Bucks and Brentsville soils on the lower, slightly concave side slopes. Also included are Nestoria soils on slightly convex slopes and moderately deep, poorly drained soils along drainageways. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Hazard of erosion: Severe
Potential for frost action: Moderate

Most areas are used as woodland. A few areas are used for hay or pasture. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil is poorly suited to cultivated crops because of the severe hazard of erosion. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope is the main limitation on sites for dwellings with basements. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome this limitation.

The slope is the main limitation on sites for local roads and streets. Constructing the roads on the contour and land shaping and grading help to overcome this limitation.

The depth to bedrock and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IVe.

21E—Penn silt loam, 25 to 45 percent slopes. This soil is moderately deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from about 5 to 200 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, reddish brown silt loam

Subsoil:
9 to 16 inches, dark red silt loam
16 to 21 inches, reddish brown channery silt loam
21 to 36 inches, weak red extremely channery silt loam

Bedrock:
36 inches, soft siltstone

Included with this soil in mapping are small areas of Bucks soils on the slightly concave lower parts of side slopes. Also included are Nestoria soils on slightly convex slopes and moderately deep, poorly drained soils along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Hazard of erosion: Severe
Potential for frost action: Moderate

Most areas are used as woodland. A few areas are used as pasture. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil is generally unsuited to cultivated crops and to hay and pasture because of the severe hazard of erosion.

The potential productivity for trees on this soil is moderate. The main management concerns are the severe hazard of erosion and an equipment limitation, which are caused by the slope. The proper construction and maintenance of roads, trails, landings, and fire lanes can reduce the hazard of erosion.

This soil is generally unsuited to dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The slope is the main limitation on sites for local roads and streets. Constructing the roads on the contour and land shaping and grading help to overcome this limitation.

The capability subclass is VIIe.

21F—Nestoria-Rock outcrop complex, 25 to 50 percent slopes. This map unit consists of a shallow, well drained Nestoria soil intermingled with Rock outcrop. The unit is on very steep side slopes in the uplands. Slopes are smooth or convex and are 100 to 300 feet long. Areas range from 5 to 50 acres in size. They are about 65 percent Nestoria soil, 20 percent Rock outcrop, and 15 percent included soils. The Nestoria soil and Rock outcrop occur as areas so intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Nestoria soil are as follows—

Surface layer:
0 to 2 inches, dark reddish brown very gravelly silt loam

Subsoil:
2 to 18 inches, red extremely gravelly silt loam

Bedrock:
18 to 36 inches, highly fractured, weathered siltstone
36 inches, hard siltstone

Included in this unit in mapping are Penn soils on the concave lower parts of side slopes and Rowland soils along drainageways. Also included, on the narrow tops of upland slopes, are small areas of Nestoria soils that have slopes of 3 to 15 percent. Included soils make up as much as 20 percent of the unit.

Properties of the Nestoria soil —

Permeability: Moderate
Available water capacity: Very low
Depth to bedrock: 10 to 20 inches
Hazard of erosion: Severe
Potential for frost action: Moderate

Most areas are used as woodland. Woodland species include red oak, Virginia pine, and white oak.

This unit is unsuited to cultivated crops and to pasture because of the slope and the Rock outcrop.

The potential productivity for trees on this unit is moderate or low. The main management concerns are the hazard of erosion, an equipment limitation, seedling mortality, and windthrow, which are caused by the slope, the Rock outcrop, and the shallowness of the Nestoria soil. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce the hazard of windthrow. Mulching exposed slopes helps to control erosion.

The slope and the Rock outcrop are severe limitations on sites for local roads and streets. In many areas the bedrock can be ripped by machinery. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The slope, the Rock outcrop, and the depth to bedrock are severe limitations on sites for dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is VIIe in areas of the Nestoria soil.

22A—Readington silt loam, 0 to 3 percent slopes. This soil is deep or very deep and is moderately well drained. It is in upland depressions and along drainageways. Areas range from 5 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 3 inches, very dark grayish brown silt loam

Subsurface layer:
3 to 6 inches, brown silt loam

Subsoil:
6 to 14 inches, brown silt loam
14 to 20 inches, yellowish red silty clay loam
20 to 30 inches, yellowish red silty clay loam that has light gray and strong brown mottles
30 to 44 inches, red channery silt loam

Bedrock:
44 inches, slightly weathered siltstone

Included with this soil in mapping are small areas of Croton soils on the lower parts of the landscape. Also included are small areas of Penn and Brentsville soils. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Low
Depth to bedrock: 40 to 70 inches
Water table: Above the firm part of the subsoil in winter and early spring
Potential for frost action: Moderate

Most areas are used for cultivated crops. Some areas are used as hayland or pasture or as grassland around drainageways.

This soil is suited to cultivated crops. The main limitation is the seasonal high water table, which often delays planting and interferes with harvesting. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. The high water table restricts the root growth of some legumes. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The high water table and a restricted rooting depth are the main management concerns. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The high water table is the main limitation on sites for dwellings, especially those with basements. This limitation can be overcome by land shaping so that surface water moves away from the dwellings, by sealing foundations, and by installing drains near footings.

The high water table, the potential for frost action, and low strength are the main limitations on sites for local roads and streets. Installing drains helps to prevent the damage caused by the high water table. Providing coarse grained subgrade or base material helps to prevent the damage caused by frost action and low strength.

The high water table and the moderately slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIw.

22B—Readington silt loam, 3 to 8 percent slopes. This soil is deep or very deep and is moderately well drained. It is in upland depressions and along drainageways. Areas range from 5 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
 0 to 3 inches, very dark grayish brown silt loam

Subsurface layer:
 3 to 6 inches, brown silt loam

Subsoil:
 6 to 14 inches, brown silt loam
 14 to 20 inches, yellowish red silty clay loam
 20 to 30 inches, yellowish red silty clay loam that has light gray and strong brown mottles
 30 to 44 inches, red channery silt loam

Bedrock:
 44 inches, slightly weathered siltstone

Included with this soil in mapping are small areas of Croton soils on the lower parts of the landscape. Also included are small areas of Penn and Brentsville soils. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Low
Depth to bedrock: 40 to 70 inches
Water table: Above the firm part of the subsoil in winter and early spring
Potential for frost action: Moderate

Most areas are used for cultivated crops. Some areas are used as hayland or pasture or as grassland around drainageways.

This soil is suited to cultivated crops. The main limitation is the seasonal high water table. The soil can be easily tilled when moist, but the seasonal high water table often delays planting and interferes with harvesting. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. The high water table restricts the root growth of some legumes. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The high water table and a restricted rooting depth are the main management concerns. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The high water table is the main limitation on sites for dwellings, especially those with basements. This limitation can be overcome by land shaping so that surface water moves away from the dwellings, by sealing foundations, and by installing drains near footings.

The high water table, the potential for frost action, and low strength are the main limitations on sites for local roads and streets. Installing drains helps to prevent the damage caused by the high water table. Providing coarse grained subgrade or base material helps to prevent the damage caused by frost action and low strength.

The high water table and the moderately slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

23A—Croton silt loam, 0 to 3 percent slopes. This soil is deep, poorly drained, and slowly permeable. It is in upland depressions and at the head of drainageways.

Slopes are smooth and may be dissected by small streams. Areas range from 5 to 200 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 12 inches, brown silt loam

Subsoil:
12 to 32 inches, pinkish gray silty clay loam that is densely compacted in the lower part and has strong brown mottles

Substratum:
32 to 48 inches, reddish brown silt loam that has yellowish red mottles
48 to 56 inches, dark reddish gray silty clay loam that has strong brown mottles

Bedrock:
56 inches, Triassic sandstone

Included with this soil in mapping are Readington soils in the slightly higher areas along the edges of the map unit. Also included, near drainageways, are very poorly drained soils that are commonly ponded in winter and spring. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Slow
Available water capacity: Moderate
Water table: Within a depth of 6 inches in late winter and early spring; above the surface after heavy rainfall in some areas
Potential for frost action: High

Most areas are used as woodland or pasture. Some areas are used as cropland.

This soil is poorly suited to cultivated crops. Wetness delays planting in spring and limits the use of equipment. Seedlings commonly are damaged by ponding in late spring and early summer. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to maintain or increase the content of organic matter in the surface layer and increase the rate of water infiltration.

This soil is suited to hay and pasture. The high water table restricts the root growth of some legumes. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for water-tolerant trees on this soil is moderate. The main management concerns are a severe equipment limitation and a severe hazard of seedling mortality, which are caused by the high water table. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The high water table is the main limitation on sites for septic tank absorption fields and dwellings. Overcoming this limitation is difficult. The better suited soils on uplands should be selected.

The high water table and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by the high water table. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

The capability subclass is IVw.

24C—Montalto silt loam, 8 to 15 percent slopes, very stony. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 50 acres in size. Stones cover 0.1 to 3.0 percent of the surface.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 12 inches, dark reddish brown silt loam

Subsoil:
12 to 15 inches, dark red silt loam
15 to 23 inches, dark red silty clay loam
23 to 42 inches, dark red silty clay
42 to 54 inches, variegated red and strong brown silty clay loam

Substratum:
54 to 72 inches, variegated strong brown and yellowish red silt loam

Included with this soil in mapping are areas of Legore soils on slightly convex slopes. Also included are small areas of Neshaminy soils and a few areas where the surface is bouldery. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: High
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: Moderate

Most areas are used as woodland. Woodland species include black oak, yellow-poplar, and Virginia pine.

This soil is poorly suited to cultivated crops and hay. In isolated areas that are free of stones, it is suited to cultivated crops, but few of these areas can be economically farmed. The main limitation is the surface stones.

This soil is suited to pasture renovation. In areas that are free of stones, it is well suited to pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The surface stones restrict the use of planting and harvesting equipment. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The high shrink-swell potential is the main limitation on sites for dwellings. Adding extra reinforcement in footings and foundations and backfilling with sandy material help to overcome this limitation.

The high shrink-swell potential and low strength are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by low strength.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is VIs.

24D—Montalto silt loam, 15 to 25 percent slopes, very stony. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 50 acres in size. Stones cover 0.1 to 3.0 percent of the surface.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
- 0 to 12 inches, dark reddish brown silt loam

Subsoil:
- 12 to 15 inches, dark red silt loam
- 15 to 23 inches, dark red silty clay loam
- 23 to 42 inches, dark red silty clay
- 42 to 54 inches, variegated red and strong brown silty clay loam

Substratum:
- 54 to 72 inches, variegated strong brown and yellowish red silt loam

Included with this soil in mapping are areas of Legore soils on slightly convex slopes. Also included are small areas of Neshaminy soils and a few areas where the surface is bouldery. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: High
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: Moderate

Most areas are used as woodland. Woodland species include black oak, yellow-poplar, and Virginia pine.

This soil is poorly suited to cultivated crops and hay. The slope and the surface stones are the main limitations.

This soil is suited to pasture renovation. In areas that are free of stones, it is well suited to pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The slope, the hazard of erosion, and the surface stones are the main management concerns. The surface stones and the slope restrict the use of planting and harvesting equipment. Mulching exposed slopes helps to control erosion.

The slope and the shrink-swell potential are the main limitations on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping help to overcome the slope. Adding extra reinforcement in footings and foundations and backfilling with sandy material help to prevent the damage caused by shrinking and swelling.

The slope, the shrink-swell potential, and low strength are the main limitations on sites for local roads and streets. Land shaping and grading help to overcome the slope. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by low strength.

The slope and the moderately slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is VIIs.

25B—Legore silt loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 80 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 28 inches, yellowish red silty clay loam
28 to 34 inches, yellowish red gravelly silt loam

Substratum:
34 to 60 inches, yellowish red gravelly loam

Included with this soil in mapping are areas of Legore soils that have a very stony surface. These soils are mostly in wooded areas. Also included are Watchung and Jackland soils in depressions and along drainageways, Brinklow soils in convex areas on side slopes, and a few areas of Montalto soils. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

This soil is well suited to dwellings.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The moderate permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

25C—Legore silt loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on broad ridgetops and side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 28 inches, yellowish red silty clay loam
28 to 34 inches, yellowish red gravelly silty clay loam

Substratum:
34 to 60 inches, yellowish red gravelly loam

Included with this soil in mapping are areas of Legore soils that have a very stony surface. These soils are mostly in wooded areas. Also included are Watchung and Jackland soils in depressions and along drainageways, Brinklow soils in convex areas on side slopes, and a few areas of Montalto soils. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Hazard of erosion: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope is the main limitation on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome this limitation.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The moderate permeability and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

26B—Montalto silt loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on broad ridgetops in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 12 inches, dark reddish brown silt loam

Subsoil:
12 to 15 inches, dark red silt loam
15 to 23 inches, dark red silty clay loam
23 to 42 inches, dark red silty clay
42 to 54 inches, variegated red and strong brown silty clay loam

Substratum:
54 to 72 inches, variegated strong brown and yellowish red silt loam

Included with this soil in mapping are areas of Legore soils on slightly convex slopes. Also included are small areas of Neshaminy soils and a few areas where the surface is stony. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: High
Shrink-swell potential: High
Potential for frost action: Moderate

Most areas are used for cultivated crops or for pasture. A few areas are wooded or are used for urban development. Woodland species include black oak, yellow-poplar, and Virginia pine.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The high shrink-swell potential is the main limitation on sites for dwellings. Adding extra reinforcement in footings and foundations and backfilling with sandy material help to overcome this limitation.

The high shrink-swell potential and low strength are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by low strength.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

26C—Montalto silt loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 12 inches, dark reddish brown silt loam

Subsoil:
12 to 15 inches, dark red silt loam
15 to 23 inches, dark red silty clay loam
23 to 42 inches, dark red silty clay
42 to 54 inches, variegated red and strong brown silty clay loam

Substratum:
54 to 72 inches, variegated strong brown and yellowish red silt loam

Included with this soil in mapping are areas of Legore soils on slightly convex slopes. Also included are small areas of Neshaminy soils and a few areas where the surface is stony. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: High
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: Moderate

Most areas are used for cultivated crops or for pasture. A few areas are wooded or are used for urban development.Woodland species include black oak, yellow-poplar, and Virginia pine.

This soil is well suited to cultivated crops. Controlling erosion is the main management concern. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The high shrink-swell potential is the main limitation on sites for dwellings. Adding extra reinforcement in footings and foundations and backfilling with sandy material help to overcome this limitation.

The high shrink-swell potential and low strength are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by low strength.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

27B—Neshaminy silt loam, 3 to 8 percent slopes. This soil is deep and well drained. It is on broad ridgetops and side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 75 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 5 inches, dark brown silt loam

Subsurface layer:
5 to 8 inches, yellowish red silt loam

Subsoil:
8 to 13 inches, yellowish red silty clay loam
13 to 23 inches, red silty clay loam
23 to 35 inches, red clay loam
35 to 48 inches, red silty clay loam

Bedrock:
48 to 54 inches, loose, weathered mica schist
54 inches, hard, granitized mica schist

Included with this soil in mapping are small areas of Montalto soils. Also included are areas of Brinklow soils and a few areas where the surface is stony. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Depth to bedrock: More than 48 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops or for pasture. Some areas are wooded or are used for urban development.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The depth to bedrock is the main limitation on sites for dwellings with basements. No limitations affect the use of this soil as a site for dwellings without basements.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The moderate permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

27C—Neshaminy silt loam, 8 to 15 percent slopes. This soil is deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 5 inches, dark brown silt loam

Subsurface layer:
5 to 8 inches, yellowish red silt loam

Subsoil:
8 to 13 inches, yellowish red silty clay loam
13 to 23 inches, red silty clay loam
23 to 35 inches, red clay loam
35 to 48 inches, red silty clay loam

Bedrock:
48 to 54 inches, loose, weathered mica schist
54 inches, hard, granitized mica schist

Included with this soil in mapping are small areas of Montalto soils. Also included are areas of Brinklow soils and a few areas where the surface is stony. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Depth to bedrock: More than 48 inches
Potential for frost action: Moderate

Most areas are used for cultivated crops or for pasture. Some areas are wooded or are used for urban development.

This soil is suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope and the depth to bedrock are the main limitations on sites for dwellings. Land shaping and grading can help to overcome the slope. In most areas bedrock will be encountered during excavation on sites for dwellings with basements.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

28A—Watchung silty clay loam, 0 to 3 percent slopes. This soil is very deep and poorly drained. It is on flats and in depressions on uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 10 to 300 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, dark grayish brown silty clay loam

Subsoil:
9 to 15 inches, olive gray clay that has olive mottles
15 to 22 inches, greenish gray silty clay loam
22 to 33 inches, gray silty clay loam

Substratum:
33 to 45 inches, olive and greenish gray silty clay loam
45 to 54 inches, greenish gray loam that has light olive brown mottles
54 to 65 inches, olive and olive gray clay loam that has light olive brown mottles

Included with this soil in mapping are Jackland soils in the slightly higher areas. Also included are small, isolated areas of soils that are moderately deep over bedrock and areas of Legore soils along the edges of the map unit. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Slow
Available water capacity: High
Water table: Within a depth of 12 inches during winter and spring

Potential for frost action: High

Most areas are used as woodland. Woodland species include black oak and pin oak.

Because of the poor drainage and the slow permeability, this soil is generally unsuited to most crops.

This soil is poorly suited to hay and pasture. The high water table restricts the root growth of some legumes. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concern is the wetness, which can result in seedling mortality and can limit the use of equipment. The trees should not be harvested during wet periods.

The high water table is the main limitation on sites for dwellings. Overcoming this limitation is difficult. The better suited soils on uplands should be selected as sites for dwellings.

The high water table, low strength, and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by the high water table. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength and frost action.

The high water table and the slow permeability are the main limitations on sites for septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is IVw.

29B—Jackland silt loam, 3 to 8 percent slopes. This soil is very deep and is moderately well drained or somewhat poorly drained. It is on uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 80 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 10 inches, dark yellowish brown silt loam

Subsoil:
10 to 48 inches, yellowish brown clay loam

Substratum:
48 to 54 inches, variegated pale yellow and pale brown clay loam
54 to 69 inches, variegated pale yellow, yellow, and pale olive sandy loam

Included with this soil in mapping are Watchung soils in low areas and along drainageways and Legore soils in high areas. Also included are some areas of soils that are similar to the Jackland soil but are moderately deep over bedrock. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Very slow
Available water capacity: Moderate
Water table: At a depth of 12 to 24 inches from December through April
Shrink-swell potential: Very high
Potential for frost action: High

Most areas are used as woodland. Woodland species include red oak, yellow-poplar, and Virginia pine.

This soil is suited to cultivated crops. The very slow permeability and the high water table are the main management concerns. Excess water delays plowing and causes the soil to warm slowly in spring. The crops can be damaged by ponding after periods of heavy rainfall. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is high. The main management concerns are the high water table and the very slow permeability, which can result in seedling mortality and windthrow and can limit the use of equipment. The trees should not be harvested during wet periods.

The high water and the shrink-swell potential are the main limitations on sites for dwellings, especially those with basements. Installing drains near footings and land shaping so that surface water moves away from the dwellings help to prevent the damage caused by the high water table. Adding extra reinforcement in footings and backfilling with sandy material help to prevent the damage caused by shrinking and swelling.

Low strength, the potential for frost action, and the shrink-swell potential are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by low strength, frost action, and shrinking and swelling.

The high water table and the very slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

35B—Chrome and Conowingo soils, 3 to 8 percent slopes. This unit consists of a moderately deep, well drained Chrome soil and a deep or very deep, moderately well drained or somewhat poorly drained Conowingo soil. The Conowingo soil generally is slightly lower on the landscape than the Chrome soil. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 20 to 200 acres in size. They are about 50 percent Chrome soil, 30 percent Conowingo soil, and 20 percent other soils. Individual areas may have one or both of the major soils.

Typically, the Chrome soil is covered by a thin layer of decomposed and partially decomposed leaves and twigs. Under this layer, the typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 10 inches, light olive brown silt loam

Subsoil:
10 to 16 inches, dark yellowish brown silty clay loam
16 to 23 inches, brown and yellowish brown gravelly silty clay loam

Bedrock:
23 inches, hard, fractured serpentine

The typical sequence, depth, and composition of the layers in the Conowingo soil are as follows—

Surface layer:
0 to 9 inches, light olive brown silt loam

Subsoil:
9 to 17 inches, yellowish brown silty clay loam
17 to 27 inches, yellowish brown gravelly silty clay loam that has olive gray, light olive brown, and strong brown mottles
27 to 32 inches, olive gray silty clay loam that has strong brown mottles

Substratum:
32 to 46 inches, strong brown gravelly silt loam
46 to 60 inches, variegated strong brown, light yellowish brown, and brownish yellow very gravelly silt loam

Included with these soil in mapping are small areas of Travilah soils on slightly concave slopes. Also included are areas that are very stony and a few areas of well drained, deep or very deep soils. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate in the Chrome soil; slow in the Conowingo soil
Available water capacity: Low in the Chrome soil; high in the Conowingo soil
Depth to bedrock: 20 to 40 inches in the Chrome soil; more than 40 inches in the Conowingo soil
Depth to a seasonal high water table: More than 60 inches in the Chrome soil; 18 to 24 inches in the Conowingo soil
Shrink-swell potential: Moderate
Potential for frost action: Moderate in the Chrome soil; high in the Conowingo soil

Most areas are used as woodland. A few areas are used for cultivated crops or for pasture. Woodland species include red oak, white oak, black oak, and chestnut oak.

These soils are suited to cultivated crops and hay. The high water table in the Conowingo soil is the main limitation. Excess water delays plowing and causes the soils to warm slowly in spring. The crops can be damaged by ponding after periods of heavy rainfall. Excess surface water can be removed by keeping natural drainageways open. Incorporating crop residue into the surface layer maintains the content of organic matter and improves tilth.

These soils are well suited to permanent pasture. Grazing during wet periods and overgrazing are the major concerns in managing pasture. Grazing when the soils are wet results in compaction of the surface layer. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderate or moderately high. The seasonal high water table in the Conowingo soil restricts root growth and limits the use of equipment to dry periods.

The depth to bedrock in the Chrome soil and the high water table in the Conowingo soil are the main limitations on sites for dwellings, especially those with basements. Building above the bedrock and landscaping with extra fill can help to overcome the depth to bedrock. The Conowingo soil should not be used as a site for dwellings with basements.

Low strength and the shrink-swell potential in the Chrome soil and the high potential for frost action in the Conowingo soil are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength, shrinking and swelling, and frost action.

The depth to bedrock in the Chrome soil and the high water table in the Conowingo soil are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe in areas of the Chrome soil and IIIw in areas of the Conowingo soil.

35C—Chrome silt loam, 8 to 15 percent slopes. This soil is moderately deep and well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 20 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 10 inches, light olive brown silt loam

Subsoil:
10 to 16 inches, dark yellowish brown silty clay loam
16 to 23 inches, brown and yellowish brown gravelly silty clay loam

Bedrock:
23 inches, hard, fractured serpentine

Included with this soil in mapping are small areas of Travilah soils on slightly concave slopes. Also included are areas of Chrome soils that have a very stony surface and a few areas of soils that are deep or very deep over bedrock. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Low
Hazard of erosion: Moderate
Depth to bedrock: 20 to 40 inches

Most areas are used as woodland. A few areas are used for cultivated crops or for pasture. Woodland species include red oak, white oak, and chestnut oak.

This soil is suited to cultivated crops. The slope and the moderate hazard of erosion are the main management concerns. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope and the depth to bedrock are the main limitations on sites for dwellings, especially those with basements. Building above the bedrock and landscaping with additional fill help to overcome the depth to bedrock. The deeper included soils are better sites.

The depth to bedrock, the slope, and low strength are the main limitations on sites for local roads and streets. Bedrock generally will be encountered during grading and land shaping. The roads should be constructed on the contour and designed so that they conform to the natural slope of the land. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

36A—Conowingo silt loam, 0 to 3 percent slopes. This soil is deep or very deep and is moderately well drained or somewhat poorly drained. It is in depressions on uplands. Slopes generally are smooth. Areas range from 5 to 30 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, light olive brown silt loam

Subsoil:
9 to 17 inches, yellowish brown silty clay loam
17 to 27 inches, yellowish brown gravelly silty clay loam that has olive gray, light olive brown, and strong brown mottles
27 to 32 inches, olive gray gravelly silty clay loam that has strong brown mottles

Substratum:
32 to 46 inches, strong brown gravelly silt loam
46 to 60 inches, variegated strong brown, light yellowish brown, and brownish yellow very gravelly silt loam

Included in mapping are small areas of soils that are similar to the Conowingo soil but are poorly drained. These soils are in low areas near drainageways. Also included are small areas of Chrome soils in the higher areas. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Slow
Available water capacity: High
Depth to bedrock: More than 42 inches
Water table: At a depth of 18 to 24 inches in late winter and early spring
Shrink-swell potential: Moderate
Potential for frost action: High

Most areas are used as woodland. Woodland species include black oak, white oak, and white pine.

This soil is suited to cultivated crops and hay. The high water table is the main management concern. Excess water delays plowing and causes the soil to warm slowly in spring. The crops can be damaged by ponding after periods of heavy rainfall. Excess surface water can be removed by keeping natural drainageways open. Incorporating crop residue into the surface layer maintains the content of organic matter and improves tilth.

This soil is well suited to permanent pasture. Grazing during wet periods and overgrazing are the major concerns in managing pasture. Grazing during wet periods results in compaction of the surface layer. Excess surface water can be removed by keeping natural drainageways open. Proper stocking rates, which maintain the key plant species, pasture rotation, and restricted grazing during wet periods are the chief management needs.

The potential productivity for trees on this soil is moderately high. The seasonal high water table restricts root growth and limits the use of equipment to dry periods.

Low strength and the potential for frost action are the main limitations on sites for local roads and streets. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength and frost action.

The high water table is the main limitation on sites for dwellings, especially those with basements. The better suited soils on uplands should be selected.

The high water table is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIw.

37B—Travilah silt loam, 3 to 8 percent slopes. This soil is moderately deep and somewhat poorly drained. It is on uplands. Slopes generally are smooth. Areas range from 10 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 5 inches, dark grayish brown silt loam

Subsurface layer:
5 to 10 inches, light yellowish brown silt loam

Subsoil:
10 to 15 inches, yellowish brown silty clay loam that has light brownish gray mottles
15 to 24 inches, dark yellowish brown silt loam that has light brownish gray mottles
24 to 33 inches, yellowish brown and dark yellowish brown silty clay loam

Bedrock:
33 inches, serpentine

Included in mapping are small areas of soils that are similar to the Travilah soil but are poorly drained. These soils are in low areas near drainageways. Also included are small areas of Chrome soils in the higher areas. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Low
Depth to bedrock: 20 to 40 inches
Water table: At a depth of 12 to 24 inches in late winter and early spring
Potential for frost action: High

Most areas are used for woodland or urban development. Woodland species include Virginia pine, red oak, and black oak.

This soil is poorly suited to cultivated crops and hay. The high water table is the main management concern. Excess water delays plowing and causes the soil to warm slowly in spring. The crops can be damaged by ponding after periods of heavy rainfall. Excess surface water can be removed by keeping natural drainageways open. Incorporating crop residue into the surface layer maintains the content of organic matter and improves tilth.

This soil is well suited to permanent pasture. Grazing during wet periods and overgrazing are the major concerns in managing pasture. Grazing during wet periods results in compaction of the surface layer. Excess surface water can be removed by keeping natural drainageways open. Proper stocking rates, which maintain the key plant species, pasture rotation, and restricted grazing during wet periods are the chief management needs.

The potential productivity for trees on this soil is moderate. Root development is restricted by the bedrock. The use of equipment is restricted to dry periods.

The potential for frost action is the main limitation on sites for local roads and streets. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The high water table and the depth to bedrock are the main limitations on sites for dwellings, especially those with basements. The better suited soils on uplands should be selected.

The high water table, the moderately slow permeability, and the depth to bedrock are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIw.

41A—Elsinboro silt loam, 0 to 3 percent slopes. This soil is very deep and well drained. It is on stream terraces. Slopes generally are smooth. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 37 inches, dark yellowish brown silt loam

Substratum:
37 to 54 inches, dark brown silt loam
54 to 60 inches, strong brown silt loam that has strong brown mottles

Included with this soil in mapping are Hatboro and Baile soils in the lower areas. Also included, near the edges of the map unit, are areas of Elsinboro soils that are stony or rocky. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Depth to a seasonal high water table: More than 5 feet
Potential for frost action: Moderate

Most areas are used as woodland. A few areas are used for hay or pasture or for urban development. Woodland species include black oak, yellow-poplar, and Virginia pine.

This soil is well suited to cultivated crops. It can be easily managed and can be cultivated without the risk of damage if good management is applied. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

The high water table is the main limitation on sites for dwellings with basements. Installing drains near footings and adequately sealing the foundations help to prevent the damage caused by the high water table. The soil is well suited to dwellings without basements.

Low strength is the main limitation on sites for local roads and streets. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage caused by low strength.

The high water table and the moderate permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability class is I.

41B—Elsinboro silt loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on stream terraces. Slopes generally are smooth. Areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 37 inches, dark yellowish brown silt loam

Substratum:
37 to 54 inches, dark brown silt loam
54 to 60 inches, strong brown silt loam that has strong brown mottles

Included with this soil in mapping are Hatboro and Baile soils in the lower areas. Also included, near the edges of the map unit, are areas of Elsinboro soils that are stony or rocky. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Depth to a seasonal high water table: More than 5 feet
Potential for frost action: Moderate

Most areas are used as woodland. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. It can be easily managed and can be cultivated without the risk of damage if good management is applied. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

The high water table is the main limitation on sites for dwellings with basements. Installing drains near footings and adequately sealing the foundations help to prevent the damage caused by the high water table. The soil is well suited to dwellings without basements.

Low strength is the main limitation on sites for local roads and streets. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage caused by low strength.

The high water table and the moderate permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

43A—Elk silt loam, 0 to 3 percent slopes, occasionally flooded. This soil is very deep and well drained. It is on stream terraces. Areas range from 2 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, brown silt loam

Subsoil:
9 to 17 inches, strong brown silt loam
17 to 42 inches, strong brown silty clay loam
42 to 54 inches, strong brown silt loam

Substratum:
54 to 66 inches, strong brown silt loam

Included with this soil in mapping are Delanco and Lindside soils on slightly concave slopes. Also included are Rowland soils in the lower, concave areas. Included soils make up less than 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Depth to a seasonal high water table: More than 6 feet
Flooding: Occasional
Potential for frost action: High

Most areas are used for cultivated crops. A few areas are used for woodland, sod, or pasture. Woodland species include yellow-poplar and red maple.

This soil is well suited to cultivated crops. It can be easily managed and can be cultivated without the risk of damage if good management is applied. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The flooding is the main hazard on sites for dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The flooding and low strength are the main limitations on sites for local roads and streets. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength. Constructing the roads and streets on raised fill material helps to prevent the damage caused by floodwater.

The capability subclass is IIw.

45A—Delanco silt loam, 0 to 3 percent slopes, occasionally flooded. This soil is very deep and is moderately well drained or somewhat poorly drained. It is on stream terraces. Slopes generally are smooth. Areas range from 10 to 150 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, dark yellowish brown silt loam

Subsoil:
8 to 19 inches, dark yellowish brown silt loam
19 to 27 inches, yellowish brown silt loam that has strong brown and light brownish gray mottles
27 to 38 inches, yellowish brown silty clay loam that has strong brown and light gray mottles

Substratum:
38 to 48 inches, strong brown silt loam that has strong brown mottles
48 to 60 inches, red sandy loam that has strong brown mottles

Soil properties—

Permeability: Moderately slow
Available water capacity: High
Water table: At a depth of 12 to 30 inches in winter and early spring
Flooding: Occasional
Potential for frost action: High

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for sod.

This soil is well suited to cultivated crops. The major management concern is maintaining fertility and tilth. Some low areas require drainage by tile or ditches. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The flooding and the high water table are the main limitations on sites for dwellings. The better suited soils on uplands should be selected.

The flooding, low strength, and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by floodwater. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action and low strength.

The flooding, the high water table, and the moderately slow permeability are the main limitations on sites for septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is IIw.

46A—Huntington silt loam, 0 to 3 percent slopes, occasionally flooded. This soil is very deep and well drained. It is on flood plains. Areas range from 5 to 425 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 12 inches, dark brown silt loam

Subsoil:
12 to 60 inches, brown silt loam

Included with this soil in mapping are Lindside and Melvin soils in the lower, slightly concave areas. These soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Depth to a seasonal high water table: More than 6 feet
Flooding: Occasional, from December through March
Potential for frost action: High

Most areas are used for cultivated crops or for sod. A few areas are wooded.

This soil is well suited to cultivated crops. Flooding is a hazard, but it is rare during the growing season and seldom affects most crops. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Flooding is the main management concern. Floodwater may cover grasses or seedlings with sediments. Grazing during wet periods results in compaction of the surface layer.

Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The flooding is the main hazard on sites for dwellings and septic tank absorption fields. Overcoming this hazard is difficult. The better suited soils on uplands should be selected as sites for dwellings.

The flooding and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by floodwater. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The capability class is I.

47A—Lindside silt loam, 0 to 3 percent slopes, occasionally flooded. This soil is very deep and moderately well drained. It is on flood plains. Areas range from 5 to 400 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, brown silt loam

Subsoil:
9 to 22 inches, brown silt loam
22 to 33 inches, grayish brown silt loam

Substratum:
33 to 54 inches, grayish brown silt loam
54 to 65 inches, grayish brown clay loam

Included with this soil in mapping are Huntington soils in the slightly higher areas and Melvin soils in the slightly lower areas. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Very high
Water table: At a depth of 18 to 36 inches in late winter and early spring
Potential for frost action: High

Most areas are used for cultivated crops or are wooded.

This soil is well suited to cultivated crops. Flooding is a hazard, but it is rare during the growing season and seldom affects most crops. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Flooding is the main management concern. Floodwater may cover grasses or seedlings with sediments. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The flooding and the high water table are the main limitations on sites for dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The flooding is the main hazard on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by floodwater.

The capability subclass is IIw.

48A—Melvin silt loam, 0 to 2 percent slopes, occasionally flooded. This soil is very deep and poorly drained. It is on flood plains. Areas range from 20 to 200 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, dark grayish brown silt loam that has dark yellowish brown mottles

Subsoil:
9 to 24 inches, light brownish gray silt loam that has dark yellowish brown and yellowish brown mottles
24 to 46 inches, light gray silty clay loam that has dark yellowish brown and yellowish brown mottles
46 to 60 inches, light gray silt loam that has dark yellowish brown and yellowish brown mottles

Included in mapping are soils that are similar to the Melvin soil but are very poorly drained and are ponded for long periods in winter and early spring. Also included are Huntington and Lindside soils in the slightly higher areas. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Very high
Water table: Within a depth of 12 inches in late winter and early spring
Potential for frost action: High
Flooding: Occasional

Most areas are used as woodland. A few areas are used as cropland or pasture.

This soil is poorly suited to cultivated crops. The flooding and the high water table are the main limitations. Wetness delays planting in spring and limits the use of equipment. Seedlings commonly are damaged by ponding in late spring and early summer. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to maintain or increase the content of organic matter in the surface layer and increase the rate of water infiltration.

This soil is suited to hay and pasture. The high water table restricts the root growth of some legumes. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for water-tolerant trees on this soil is high. The main management concerns are the flooding and the high water table, which cause seedling mortality and windthrow and limit the use of equipment. The trees should not be harvested during wet periods. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce the hazard of windthrow.

The high water table, the flooding, and low strength are the main limitations on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by floodwater. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength and the high water table.

The high water table and the flooding are the main limitations on sites for dwellings and septic tank absorption fields. Overcoming these limitations is difficult. The better suited soils on uplands should be selected.

The capability subclass is IIIw.

50A—Rowland silt loam, 0 to 3 percent slopes, occasionally flooded. This soil is very deep and is moderately well drained or somewhat poorly drained. It is on stream terraces, in upland depressions, and along drainageways. Areas range from 5 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 11 inches, dark brown silt loam

Subsoil:
11 to 14 inches, brown silt loam
14 to 34 inches, light brown silt loam

Substratum:
34 to 54 inches, brown and light brown silt loam
54 to 66 inches, brown and light brown, stratified silt loam and gravelly loamy sand

Included with this soil in mapping are Croton soils in the lower areas and the well drained Penn soils in the higher areas along the edges of the map unit. Included soils make up as much as 10 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Water table: At a depth of 12 to 36 inches in winter and spring
Potential for frost action: High

Most areas are used as woodland. A few areas are used for cultivated crops or for pasture. Woodland species include red oak, Virginia pine, and white oak.

This soil is suited to cultivated crops. The high water table is the main limitation. Excess water delays plowing and causes the soil to warm slowly in spring. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to control erosion, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concern is the high water table, which limits the use of equipment to dry periods.

The flooding and the high water table are the main limitations on sites for dwellings. Overcoming these limitations is difficult. The better suited soils on uplands should be selected.

The flooding and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads on raised fill material helps to prevent the damage caused by floodwater. The soil is soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

The flooding, the high water table, and the moderately slow permeability are the main limitations on sites for septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is IIw.

51A—Bowmansville-Melvin silt loams, 0 to 2 percent slopes, occasionally flooded. These very deep, somewhat poorly drained or poorly drained soils are on flood plains that are commonly dissected by small streams and ponded areas. Areas range from 20 to 150 acres in size. They are about 70 percent Bowmansville soil, 25 percent Melvin soil, and 5 percent other soils. The Bowmansville and Melvin soils occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Bowmansville soil are as follows—

Surface layer:
0 to 11 inches, reddish brown silt loam

Subsoil:
11 to 15 inches, reddish brown silt loam
15 to 34 inches, pinkish gray silt loam that has strong brown mottles

Substratum:
34 to 48 inches, pinkish gray silt loam that has strong brown mottles
48 to 62 inches, pinkish gray sandy loam that has strong brown mottles

The typical sequence, depth, and composition of the layers in the Melvin soil are as follows—

Surface layer:
0 to 9 inches, dark grayish brown silt loam that has dark yellowish brown mottles

Subsoil:
9 to 24 inches, light brownish gray silt loam that has dark yellowish brown and yellowish brown mottles
24 to 46 inches, light gray silty clay loam that has dark yellowish brown and yellowish brown mottles
46 to 60 inches, light gray silt loam that has dark yellowish brown and yellowish brown mottles

Included in mapping are small areas of soils that are similar to the Bowmansville and Melvin soils but are very poorly drained and have a water table at or above the surface for long periods in winter and spring. Also included are small areas of Lindside soils on the slightly higher parts of the landscape. Included areas make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the Bowmansville soil; moderate in the Melvin soil
Available water capacity: High in the Bowmansville soil; very high in the Melvin soil
Depth to a seasonal high water table: 0 to 18 inches
Potential for frost action: High
Flooding: Occasional

Most areas occur as woodland or marsh. A few areas are used as cropland or pasture. Woodland species include pin oak and willow.

These soils are generally unsuited to cultivated crops. The high water table and long periods of ponding are the main management concerns. The areas of marsh remain wet or ponded into the growing season.

These soils are poorly suited to hay and pasture. The high water table, the flooding, and the ponding are the main limitations. The major management concerns are restricting grazing when the soils are wet and selecting water-tolerant species for planting.

The potential productivity for trees on these soils is moderately high or high. The high water table and the ponding limit the use of equipment and result in seedling mortality and windthrow. The trees should not be harvested during wet periods. The slope restricts the use of planting and harvesting equipment. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce the hazard of windthrow.

The flooding and the high water table are severe limitations on sites for dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The high water table, the flooding, low strength, and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads on raised fill material and installing a drainage system help to prevent the damage caused by the high water table and flooding. The soils are soft when wet. As a result, cracks form in the pavement if the roads are subject to heavy traffic. Providing coarse grained subgrade or base material helps to prevent the damage caused by low strength and frost action.

The capability subclass is IIIw.

53A—Codorus silt loam, 0 to 3 percent slopes, occasionally flooded. This soil is very deep and is moderately well drained or somewhat poorly drained. It is on flood plains. Areas range from 10 to 75 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 11 inches, dark brown silt loam

Subsoil:
11 to 18 inches, brown silt loam
18 to 40 inches, yellowish brown gravelly silt loam that has light brownish gray and yellowish brown mottles

Substratum:
40 to 60 inches, yellowish brown very gravelly silt loam that has light brownish gray and yellowish brown mottles

Included with this soil in mapping are Hatboro soils in the slightly lower areas and well drained soils in the slightly higher areas adjacent to stream channels. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Water table: At a depth of 12 to 24 inches in late winter and in spring
Flooding: Occasional
Potential for frost action: High

Most areas are used for hay or pasture. A few areas are used for cultivated crops or are wooded. Woodland species include red oak, white ash, yellow-poplar, and sycamore.

This soil is suited to cultivated crops. It can be easily tilled when moist, but the seasonal high water table and the flooding occasionally delay planting and interfere with harvesting. A filter strip of grasses along streams can help to control erosion and keep sediments from entering the streams. Cover crops and grassed waterways help to control runoff and erosion.

This soil is suited to hay and pasture. The high water table restricts the root growth of some legumes. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for water-tolerant trees on this soil is moderately high. The main management concerns are the flooding and the high water table, which limit the use of equipment to dry periods.

The high water table, the flooding, and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by floodwater. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by the high water table and frost action.

The high water table and the flooding are the main limitations on sites for dwellings and septic tank absorption fields. Overcoming these limitations is difficult. The better suited soils on uplands should be selected.

The capability subclass is IIw.

54A—Hatboro silt loam, 0 to 3 percent slopes, frequently flooded. This soil is very deep and poorly drained. It is on flood plains. Areas range from about 25 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 11 inches, dark grayish brown silt loam that has grayish brown mottles

Subsoil:
11 to 18 inches, grayish brown silt loam that has dark grayish brown and dark yellowish brown mottles
18 to 44 inches, dark gray silt loam

Substratum:
44 to 55 inches, dark gray silty clay loam that has brown and yellowish brown mottles
55 to 60 inches, dark gray fine sandy loam that has bluish gray mottles

Included with this soil in mapping are small areas of Codorus soils on the slightly higher parts of the landscape. Also included are some areas of soils that are very gravelly or extremely gravelly below a depth of 40 inches. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Water table: Within a depth of 6 inches in late winter and early spring
Flooding: Frequent
Potential for frost action: High

Most areas are used for hay or pasture. Some areas are wooded. Woodland species include red maple, sycamore, and pin oak.

This soil is poorly suited to cultivated crops. The flooding and the high water table are the main limitations. Wetness delays planting in spring and limits the use of equipment. Seedlings commonly are damaged by ponding in late spring and early summer. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface help to maintain or increase the content of organic matter in the surface layer and increase the rate of water infiltration.

This soil is suited to hay and pasture. The high water table restricts the root growth of some legumes. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for water-tolerant trees on this soil is moderate. The main management concerns are the flooding and the high water table, which limit the use of equipment to dry periods.

The high water table, the flooding, and the potential for frost action are the main limitations on sites for local roads and streets. Constructing the roads and streets on raised fill material helps to prevent the damage caused by floodwater. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by the high water table and frost action.

The high water table and the flooding are the main limitations on sites for dwellings and septic tank absorption fields. Overcoming these limitations is difficult. The better suited soils on uplands should be selected.

The capability subclass is IIIw.

55C—Evesboro loamy sand, 3 to 15 percent slopes. This soil is very deep and excessively drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 11 inches, dark yellowish brown loamy sand

Subsoil:
11 to 24 inches, brownish yellow loamy sand
24 to 40 inches, brownish yellow fine sand

Substratum:
40 to 60 inches, yellow fine sand that has strong brown mottles

Included with this soil in mapping are somewhat poorly drained or poorly drained soils in low areas. Also included are small areas of Croom soils. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Rapid
Available water capacity: Low
Potential for frost action: Low

Most areas are used as woodland or pasture. Woodland species include Virginia pine and white oak.

This soil is poorly suited to cultivated crops and pasture. Droughtiness, the leaching of plant nutrients, and wind erosion are the main management concerns. Minimum tillage and close-growing cover crops help to control wind erosion and minimize leaching.

The potential productivity for trees on this soil is high. Droughtiness is the main limitation. The survival and growth rates of planted seedlings can be increased by bedding and by planting in the low areas. The loose, sandy surface layer can limit the use of equipment.

The slope is the main limitation on sites for dwellings. Land shaping and designing the buildings so that they conform to the natural slope of the land help to overcome this limitation.

The slope is the main limitation on sites for local roads and streets. Constructing the roads on the contour and land shaping and grading help to overcome this limitation.

A poor filtering capacity resulting from the rapid permeability is the main limitation on sites for septic tank absorption fields. The poor filtering capacity can result in the contamination of ground water. This limitation can be overcome an alternative design that meets the requirements of State and local regulations.

The capability subclass is VIIs.

57B—Chillum silt loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 75 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 7 inches, grayish brown silt loam

Subsurface layer:
7 to 13 inches, brown silt loam

Subsoil:
13 to 28 inches, yellowish brown silt loam

Substratum:
28 to 60 inches, strong brown very gravelly sandy loam

Included with this soil in mapping are Croom and Sassafras soils. Also included are Beltsville soils in depressions. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Potential for frost action: High

Most areas are used for cultivated crops. A few areas are used for woodland, pasture, or urban development. Woodland species include white oak, yellow-poplar, and Virginia pine.

This soil is well suited to cultivated crops. The slope is the main management concern. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

This soil is well suited to dwellings.

Low strength and the potential for frost action are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength and frost action.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

57C—Chillum silt loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 40 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 7 inches, grayish brown silt loam

Subsurface layer:
7 to 13 inches, brown silt loam

Subsoil:
13 to 28 inches, yellowish brown silt loam

Substratum:
28 to 60 inches, strong brown very gravelly sandy loam

Included with this soil in mapping are Croom and Sassafras soils. Also included are Beltsville soils in depressions. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Hazard of erosion: Moderate
Potential for frost action: High

Most areas are used for cultivated crops. A few areas are used for woodland, pasture, or urban development.

This soil is suited to cultivated crops. The moderate hazard of erosion and the moderate available water capacity are the main management concerns. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope is the main limitation on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome this limitation.

Low strength and the potential for frost action are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength and frost action.

The moderately slow permeability and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

57D—Chillum silt loam, 15 to 25 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 7 inches, grayish brown silt loam

Subsurface layer:
7 to 13 inches, brown silt loam

Subsoil:
13 to 28 inches, yellowish brown silt loam

Substratum:
28 to 60 inches, strong brown very gravelly sandy loam

Included with this soil in mapping are Croom and Sassafras soils. Also included are soils that are moderately deep or deep over weathered Piedmont bedrock. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Hazard of erosion: Severe
Potential for frost action: High

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

This soil is generally unsuited to cultivated crops and hay. The moderate available water capacity and the severe hazard of erosion are the main management concerns. Contour stripcropping, minimum tillage, diversions, and grassed waterways help to control erosion. A cropping system that includes cover crops and grasses and legumes minimizes crusting, maintains or increases the content of organic matter in the surface layer, and increases the rate of water infiltration.

This soil is poorly suited to pasture. The slope is the main management concern. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concerns are the hazard of erosion and an equipment limitation, which are caused by the slope. Mulching seeded areas helps to control erosion and facilitates reseeding. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

The slope is the main limitation on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome this limitation.

Low strength, the potential for frost action, and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by low strength and frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The moderately slow permeability and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is VIe.

57UB—Chillum-Urban land complex, 0 to 8 percent slopes. This unit consists of a very deep, well drained Chillum soil intermingled with Urban land. Areas generally are irregularly shaped and are about 5 to 50 acres in size. They are about 50 percent Chillum soil and 30 to 50 percent Urban land. The Chillum soil and Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Chillum soil are as follows—

Surface layer:
0 to 7 inches, grayish brown silt loam

Subsurface layer:
7 to 13 inches, brown silt loam

Subsoil:
13 to 28 inches, yellowish brown silt loam

Substratum:
28 to 60 inches, strong brown very gravelly sandy loam

Included in this unit in mapping are areas of Croom and Sassafras soils. Also included are moderately well drained or somewhat poorly drained soils in low areas and along drainageways. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Potential for frost action: High

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have good potential for building site development and for lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetables gardens. Areas that have been very deeply excavated are generally droughty and thus have poor potential for most types of vegetation. The unit has only fair potential for most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

58B—Sassafras loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on broad ridgetops. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, dark yellowish brown loam

Subsoil:
8 to 13 inches, dark yellowish brown loam
13 to 17 inches, yellowish brown and dark yellowish brown sandy clay loam
17 to 22 inches, yellowish brown and dark yellowish brown sandy loam

Substratum:
22 to 35 inches, strong brown sandy loam
35 to 65 inches, brownish yellow loamy sand

Included with this soil in mapping are small areas of Croom and Evesboro soils. Also included are moderately well drained or somewhat poorly drained soils in low areas. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. The moderate available water capacity is the main management concern. The soil tends to be droughty during long dry periods. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and conserve moisture.

This soil is well suited to hay and pasture. Forage production is somewhat limited because of the moderate available water capacity. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

This soil is well suited to dwellings.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action.

The moderate permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

58C—Sassafras loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Slopes generally are smooth, but a few are dissected by small drainageways. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, dark yellowish brown loam

Subsoil:
8 to 13 inches, dark yellowish brown loam
13 to 17 inches, yellowish brown and dark yellowish brown sandy clay loam
17 to 22 inches, yellowish brown and dark yellowish brown sandy loam

Substratum:
22 to 35 inches, strong brown sandy loam
35 to 65 inches, brownish yellow loamy sand

Included with this soil in mapping are small areas of Croom and Evesboro soils. Also included are moderately well drained or somewhat poorly drained soils in low areas. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Moderate

Potential for frost action: Moderate

Most areas are used for cultivated crops. A few areas are used for hay or pasture or for urban development.

This soil is well suited to cultivated crops. The moderate available water capacity is the main management concern. The soil tends to be droughty during long dry periods. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and conserve moisture.

This soil is well suited to hay and pasture. Forage production is somewhat limited because of the moderate available water capacity. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high.

The slope is the main limitation on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping and grading help to overcome this limitation.

The potential for frost action and the slope are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The slope and the moderate permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IVe.

59A—Beltsville silt loam, 0 to 3 percent slopes. This soil is very deep and moderately well drained. It is on smooth uplands. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 13 inches, very dark gray and olive yellow silt loam

Subsoil:
13 to 31 inches, brownish yellow silty clay loam
31 to 42 inches, reddish yellow silty clay loam
42 to 48 inches, reddish yellow clay loam

Substratum:
48 to 60 inches, very pale brown clay loam

Included with this soil in mapping are somewhat poorly drained soils on slightly concave slopes, mainly in the Martinsburg area. Also included are Croom and Chillum soils in the slightly higher positions on the landscape. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Very slow
Available water capacity: High
Water table: At a depth of 18 to 30 inches in winter and early spring
Potential for frost action: High

Most areas are used for cultivated crops, woodland, or urban development. A few areas are used for pasture or hay.

This soil is well suited to cultivated crops. The main management concern is the very slow permeability, which can result in ponding. In some areas a surface drainage system is necessary. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concerns are seedling mortality, an equipment limitation, and windthrow, which are caused by the very slow permeability in the subsoil and the high water table. The trees should not be harvested during wet periods.

The high water table is the main limitation on sites for dwellings with basements. Land shaping so that surface water moves away from the dwellings, sealing foundations, and installing drains near footings help to overcome this limitation.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material helps to overcome this limitation.

The high water table and the very slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIw.

59B—Beltsville silt loam, 3 to 8 percent slopes. This soil is very deep and moderately well drained. It is on smooth uplands. Areas range from 5 to 75 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 13 inches, very dark gray and olive yellow silt loam

Subsoil:
13 to 31 inches, brownish yellow silty clay loam
31 to 42 inches, reddish yellow silty clay loam
42 to 48 inches, reddish yellow clay loam

Substratum:
48 to 60 inches, very pale brown clay loam

Included with this soil in mapping are small areas of somewhat poorly drained soils on slightly concave slopes. Also included are Croom and Chillum soils in the higher areas. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Very slow
Available water capacity: High
Water table: At a depth of 18 to 30 inches in winter and early spring
Potential for frost action: High

Most areas are used for cultivated crops, woodland, or urban development. A few areas are used for pasture or hay. Woodland species include red oak, black oak, and Virginia pine.

This soil is well suited to cultivated crops. The main management concern is a moderate hazard of erosion. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concerns are seedling mortality, an equipment limitation, and windthrow, which are caused by the very slow permeability in the subsoil and the high water table. The trees should not be harvested during wet periods.

The high water table is the main limitation on sites for dwellings with basements. Land shaping so that surface water moves away from the dwellings, sealing foundations, and installing drains near footings help to overcome this limitation.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material helps to overcome this limitation.

The high water table and the very slow permeability are the main limitations on sites for septic tank absorption fields. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

61B—Croom gravelly loam, 3 to 8 percent slopes. This soil is very deep and well drained. It is on smooth uplands. Areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly loam

Subsurface layer:
8 to 14 inches, light yellowish brown gravelly loam

Subsoil:
14 to 21 inches, yellowish brown very gravelly loam
21 to 28 inches, strong brown very gravelly sandy loam
28 to 42 inches, reddish yellow very gravelly sandy loam

Substratum:
42 to 65 inches, reddish yellow very gravelly loamy sand

Included with this soil in mapping are small areas of Sassafras soils. Also included are Beltsville soils in low spots and a few areas, generally near streams, where Piedmont bedrock is within 40 inches of the surface. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the subsoil; rapid in the substratum
Available water capacity: Low
Potential for frost action: Moderate

Most areas are used for cultivated crops or urban development. A few areas are wooded. Woodland species include white oak, red oak, and Virginia pine.

This soil is suited to cultivated crops. The low available water capacity is the main management concern. The soil is droughty during long dry periods. As a result, the crops are affected by moisture stress. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface increase the rate of water infiltration, maintain or increase the content of organic matter in the surface layer, and conserve moisture.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. Seedling mortality is a moderate hazard because of the low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains.

This soil is well suited to dwellings with basements.

The potential for frost action is the main limitation on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action.

A poor filtering capacity resulting from the rapid permeability in the substratum is the main limitation on sites for septic tank absorption fields. The poor filtering capacity can result in the contamination of ground water. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

61C—Croom gravelly loam, 8 to 15 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Areas range from 5 to 30 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly loam

Subsurface layer:
8 to 14 inches, light yellowish brown gravelly loam

Subsoil:
14 to 21 inches, yellowish brown very gravelly loam
21 to 28 inches, strong brown very gravelly sandy loam
28 to 42 inches, reddish yellow very gravelly sandy loam

Substratum:
42 to 65 inches, reddish yellow very gravelly loamy sand

Included with this soil in mapping are small areas of Sassafras soils, which are not gravelly. Also included are Beltsville soils in low spots and a few areas, generally near streams, where bedrock is within 40 inches of the surface. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the subsoil; rapid in the substratum
Available water capacity: Low
Hazard of erosion: Moderate
Potential for frost action: Moderate

Most areas are used for cultivated crops or urban development. A few areas are wooded. Woodland species include white oak, red oak, and Virginia pine.

This soil is suited to cultivated crops. The low available water capacity and the moderate hazard of erosion are the main management concerns. The soil is droughty during long dry periods. As a result, the crops are affected by moisture stress. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface increase the rate of water infiltration, maintain or increase the content of organic matter in the surface layer, and conserve moisture.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. Seedling mortality is a moderate hazard because of the low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains.

The slope is the main limitation on sites for dwellings with basements. Land shaping and designing the buildings so that they conform to the natural slope of the land help to overcome this limitation.

The potential for frost action and the slope are the main limitations on sites for local roads and streets.

Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by frost action. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

A poor filtering capacity resulting from the rapid permeability in the substratum is a severe limitation on sites for septic tank absorption fields. The poor filtering capacity can result in the contamination of ground water. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

61D—Croom gravelly loam, 15 to 25 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Areas range from 5 to 10 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly loam

Subsurface layer:
8 to 14 inches, light yellowish brown gravelly loam

Subsoil:
14 to 21 inches, yellowish brown very gravelly loam
21 to 28 inches, strong brown very gravelly sandy loam
28 to 42 inches, reddish yellow very gravelly sandy loam

Substratum:
42 to 65 inches, reddish yellow very gravelly loamy sand

Included with this soil in mapping are small areas of Sassafras soils. Also included, generally near streams and on convex slopes, are a few areas where bedrock is within 40 inches of the surface. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the subsoil; rapid in the substratum
Available water capacity: Low
Hazard of erosion: Severe
Potential for frost action: Moderate

Most areas are used as woodland. A few areas are used for cultivated crops or for pasture. Woodland species include white oak, red oak, and Virginia pine.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the low available water capacity are the main management concerns. The soil is droughty during long dry periods. As a result, the crops are affected by moisture stress. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface increase the rate of water infiltration, maintain or increase the content of organic matter in the surface layer, and conserve moisture.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The main management concerns are a moderate hazard of erosion, an equipment limitation, seedling mortality, and windthrow, which are caused by the slope. Areas that have been logged should be seeded and mulched.

The slope is the main limitation on sites for dwellings. Land shaping and designing the buildings so that they conform to the natural slope of the land help to overcome this limitation.

The slope is the main limitation on sites for local roads and streets. Constructing the roads on the contour and land shaping and grading help to overcome this limitation.

The slope and a poor filtering capacity resulting from the rapid permeability in the substratum are the main limitations on sites for septic tank absorption fields. The poor filtering capacity can result in the contamination of ground water. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IVe.

61E—Croom gravelly loam, 25 to 40 percent slopes. This soil is very deep and well drained. It is on side slopes in the uplands. Areas range from 5 to 25 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly loam

Subsurface layer:
8 to 14 inches, light yellowish brown gravelly loam

Subsoil:
14 to 21 inches, yellowish brown very gravelly loam
21 to 28 inches, strong brown very gravelly sandy loam
28 to 42 inches, reddish yellow very gravelly sandy loam

Substratum:
42 to 65 inches, reddish yellow very gravelly loamy sand

Included with this soil in mapping are small areas of Sassafras soils. Also included, generally near streams and on convex side slopes, are a few areas where bedrock is within 40 inches of the surface. Included soils make up as much as 15 percent of the unit.

Soil properties—

Permeability: Moderately slow in the subsoil; rapid in the substratum
Available water capacity: Low
Hazard of erosion: Severe
Potential for frost action: Moderate

Most areas are used as woodland. Woodland species include white oak, red oak, and Virginia pine.

This soil is generally unsuited to cultivated crops. The severe hazard of erosion and an equipment limitation are the main management concerns.

This soil is suited to pasture. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderate. The main management concerns are a moderate hazard of erosion, an equipment limitation, seedling mortality, and windthrow, which are caused by the slope. Areas that have been logged should be seeded and mulched.

The slope is the main limitation on sites for dwellings, local roads and streets, and septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is VIe.

61UB—Croom-Urban land complex, 0 to 8 percent slopes. This unit consists of a very deep, well drained Croom soil intermingled with Urban land. Areas generally are irregularly shaped and are about 5 to 150 acres in size. They are about 50 percent Croom soil and 30 to 50 percent Urban land. The Croom soil and Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Croom soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly loam

Subsurface layer:
8 to 14 inches, light yellowish brown gravelly loam

Subsoil:
14 to 21 inches, yellowish brown very gravelly loam
21 to 28 inches, strong brown very gravelly sandy loam
28 to 42 inches, reddish yellow very gravelly sandy loam

Substratum:
42 to 65 inches, reddish yellow very gravelly loamy sand

Included in this unit in mapping are Chillum and Evesboro soils. Also included are Beltsville soils in slightly concave areas on the lower parts of the landscape. Included soils make up as much as 15 percent of the unit.

Properties of the Croom soil—

Permeability: Moderately slow in the subsoil; rapid in the substratum
Available water capacity: Low
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Undeveloped areas are being converted to urban uses very rapidly. These areas have good potential for building site development. This unit has fair potential for lawns, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. The content of gravel is the main limitation. The potential for most recreational uses is only fair because of limited open space. Prompt revegetation of disturbed areas helps to control runoff and erosion. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

64B—Croom and Bucks soils, 3 to 8 percent slopes. This unit consists of a very deep, well drained Croom soil and a deep, well drained Bucks soil. The unit is in areas where a thin mantle of Coastal Plain sediments was deposited over an older Piedmont landscape. The Croom soil generally is higher on the landscape than the Bucks soil. Slopes generally are smooth. Areas range from 10 to 400 acres in size. They are about 50 percent Croom soil, 30 percent Bucks soil, and 20 percent other soils. Individual areas may have one or both of the major soils.

The typical sequence, depth, and composition of the layers in the Croom soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly loam

Subsurface layer:
8 to 14 inches, light yellowish brown gravelly loam

Subsoil:
14 to 21 inches, yellowish brown very gravelly loam
21 to 28 inches, strong brown very gravelly sandy loam
28 to 42 inches, reddish yellow very gravelly sandy loam

Substratum:
42 to 65 inches, reddish yellow very gravelly loamy sand

The typical sequence, depth, and composition of the layers in the Bucks soil are as follows—

Surface layer:
0 to 12 inches, dark reddish brown silt loam

Subsoil:
12 to 33 inches, reddish brown silt loam

Substratum:
33 to 45 inches, reddish brown channery silt loam

Bedrock:
45 inches, dusky red, fractured shale

Included with these soils in mapping are small areas of soils that are similar to the Croom soil but are 30 to 60 inches deep over shale and siltstone bedrock. These included soils are on convex side slopes. Also included are the moderately deep Penn and Brentsville soils on the lower parts of side slopes and Readington and Beltsville soils in the slightly lower areas. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderately slow in the subsoil of the Croom soil and rapid in the substratum; moderately slow in the Bucks soil
Available water capacity: Low in the Croom soil; moderate in the Bucks soil
Depth to bedrock: More than 60 inches in the Croom soil; more than 42 inches in the Bucks soil
Shrink-swell potential: Low in the Croom soil; moderate in the Bucks soil
Potential for frost action: Moderate

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

These soils are suited to cultivated crops. The crops respond well to applications of fertilizer and good management. They may be affected by droughtiness in the Croom soil during periods of low rainfall. Stripcropping, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to control runoff and erosion.

These soils are well suited to hay and pasture. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderate or moderately high. The Bucks soil has few limitations. Seedling mortality is a moderate hazard on the Croom soil because of the low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains.

The moderate shrink-swell potential in the Bucks soil is the main limitation on sites for dwellings with basements. Adding extra reinforcement in footings and foundations and backfilling with sandy material help to prevent the damage caused by shrinking and swelling.

The moderate shrink-swell potential in the Bucks soil and the potential for frost action in both soils are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by frost action.

The rapid permeability in the substratum of the Croom soil and the moderately slow permeability in the Bucks soil are the main limitations on sites for septic tank absorption fields. The rapid permeability in the Croom soil can result in the contamination of ground water. The moderately slow permeability in the Bucks soil can cause a backup in the septic system. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

64C—Croom and Bucks soils, 8 to 15 percent slopes. This unit consists of a very deep, well drained Croom soil and a deep, well drained Bucks soil. The unit is in areas where a thin mantle of Coastal Plain sediments was deposited over an older Piedmont landscape. The Croom soil generally is higher on the landscape than the Bucks soil. Slopes generally are smooth. Areas range from 10 to 100 acres in size. They are about 50 percent Croom soil, 30 percent Bucks soil, and 20 percent other soils. Individual areas may have one or both of the major soils.

The typical sequence, depth, and composition of the layers in the Croom soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly loam

Subsurface layer:
8 to 14 inches, light yellowish brown gravelly loam

Subsoil:
14 to 21 inches, yellowish brown very gravelly loam

21 to 28 inches, strong brown very gravelly sandy loam
28 to 42 inches, reddish yellow very gravelly sandy loam

Substratum:
42 to 65 inches, reddish yellow very gravelly loamy sand

The typical sequence, depth, and composition of the layers in the Bucks soil are as follows—

Surface layer:
0 to 12 inches, dark reddish brown silt loam

Subsoil:
12 to 33 inches, reddish brown silt loam

Substratum:
33 to 45 inches, reddish brown channery silt loam

Bedrock:
45 inches, dusky red, fractured shale

Included with these soils in mapping are small areas of soils that are similar to the Croom soil but are 30 to 60 inches deep over shale and siltstone bedrock. These included soils are on convex side slopes. Also included are the moderately deep Penn and Brentsville soils on the lower parts of side slopes and Readington and Beltsville soils in the slightly lower areas. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderately slow in the subsoil of the Croom soil and rapid in the substratum; moderately slow in the Bucks soil
Available water capacity: Low in the Croom soil; moderate in the Bucks soil
Depth to bedrock: More than 60 inches in the Croom soil; more than 42 inches in the Bucks soil
Hazard of erosion: Moderate
Shrink-swell potential: Low in the Croom soil; moderate in the Bucks soil
Potential for frost action: Moderate

Most areas are used as woodland. A few areas are used for cultivated crops.

These soils are suited to cultivated crops. The moderate hazard of erosion on both soils and the low available water capacity in the Croom soil are the main management concerns. The crops respond well to applications of fertilizer and good management. They may be affected by droughtiness in the Croom soil during periods of low rainfall. Stripcropping, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to control runoff and erosion.

These soils are well suited to hay and pasture. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on these soils is moderate or moderately high. The Bucks soil has few limitations. Seedling mortality is a moderate hazard on the Croom soil because of the low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains.

The slope of both soils and the moderate shrink-swell potential in the Bucks soil are the main limitations on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping help to overcome the slope. Adding extra reinforcement in footings and foundations and backfilling with sandy material help to prevent the damage caused by shrinking and swelling.

The slope and potential for frost action in areas of both soils and the shrink-swell potential of the Bucks soil are the main limitations on sites for local roads and streets. Constructing the roads on the contour and land shaping and grading help to overcome the slope. Providing coarse grained subgrade or base material helps to prevent the damage to pavement caused by shrinking and swelling and by frost action.

The rapid permeability in the substratum of the Croom soil and the moderately slow permeability in the Bucks soil are the main limitations on sites for septic tank absorption fields. The rapid permeability in the Croom soil can result in the contamination of ground water. The moderately slow permeability in the Bucks soil can cause a backup in the septic system. These limitations can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIIe.

65B—Wheaton silt loam, 0 to 8 percent slopes. This very deep, well drained soil is in areas that have been graded, cut, and filled for recreational uses, such as golf courses, athletic fields, and playgrounds, and in areas of reclaimed sanitary landfills. Areas are generally about 5 to 200 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 6 inches, very dark grayish brown silt loam

Substratum:
6 to 13 inches, strong brown loam

13 to 20 inches, brown loam
20 to 38 inches, strong brown loam
38 to 68 inches, yellowish red loam

Included with this soil in mapping are small areas of strongly sloping or moderately steep soils and a few areas of soils that are moderately deep or shallow over weathered bedrock. Also included, near drainageways, are fill areas where the soils are somewhat poorly drained or moderately well drained. Included soils make up as much as 20 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: High
Depth to bedrock: More than 5 feet
Potential for frost action: Moderate

Most areas are used for residential development or parks.

This soil is well suited to cultivated crops. The slope is the main limitation. A cropping system that includes cover crops and grasses and legumes and a conservation tillage system that leaves some or all of the crop residue on the surface minimize crusting, maintain or increase the content of organic matter in the surface layer, and increase the rate of water infiltration.

This soil is well suited to hay and pasture. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, harvesting at the proper stage of plant growth, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The soil is soft when wet. As a result, the use of heavy equipment is restricted to dry periods.

This soil is well suited to dwellings.

The potential for frost action and low strength are the main limitations on sites for local roads and streets. Providing coarse grained subgrade or base material to frost depth helps to prevent the damage to pavement caused by frost action and low strength.

The moderate permeability is the main limitation on sites for septic tank absorption fields. This limitation can be overcome by an alternative design that meets the requirements of State and local regulations.

The capability subclass is IIe.

66UB—Wheaton-Urban land complex, 0 to 8 percent slopes. This unit consists of a very deep, well drained Wheaton soil intermingled with Urban land (fig. 8). The Wheaton soil has been graded, cut, filled, or otherwise disturbed during urbanization. Slopes generally are long and complex and are moderately sloping. Areas generally are irregularly shaped and are about 5 to 300 acres in size. They are about 50 percent Wheaton soil and 30 to 50 percent Urban land. The Wheaton soil and Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Wheaton soil are as follows—

Surface layer:
0 to 6 inches, very dark grayish brown silt loam

Substratum:
6 to 13 inches, strong brown loam
13 to 20 inches, brown loam
20 to 38 inches, strong brown loam
38 to 68 inches, yellowish red loam

Included in this unit in mapping are small areas of Glenville and Baile soils on the lower parts of the landscape. Some of these areas have been covered by fill. Also included are small, generally convex areas of Brinklow and Blocktown soils and a few areas where bedrock is exposed. Included areas make up as much as 15 percent of the unit.

Properties of the Wheaton soil—

Permeability: Moderate
Available water capacity: High
Depth to bedrock: More than 5 feet
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have few limitations if used for building site development and are well suited to lawns, shade and ornamental trees, shrubs, vines, and gardens. Areas that have been very deeply excavated are generally droughty and thus are poorly suited to most types of vegetation. The unit has only fair potential most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

66UC—Wheaton-Urban land complex, 8 to 15 percent slopes. This unit consists of a very deep, well drained Wheaton soil intermingled with Urban land. The Wheaton soil has been graded, cut, filled, or otherwise disturbed during urbanization. Slopes generally are long and complex and are moderately sloping. Areas generally are irregularly shaped and are about 5 to 50 acres in size. They are about 50 percent Wheaton soil and 30 to 50 percent Urban land. The Wheaton soil and

Figure 8.—An area of Wheaton-Urban land complex, 0 to 8 percent slopes, where grading and land shaping have altered the original landscape.

Urban land occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Wheaton soil are as follows—

Surface layer:
0 to 6 inches, very dark grayish brown silt loam

Substratum:
6 to 13 inches, strong brown loam
13 to 20 inches, brown loam
20 to 38 inches, strong brown loam
38 to 68 inches, yellowish red loam

Included in this unit in mapping are small areas of Glenville and Baile soils on the lower parts of the landscape. Some of these areas have been covered by fill. Also included are small, generally convex areas of Brinklow and Blocktown soils and a few areas where bedrock is exposed. Included areas make up as much as 15 percent of the unit.

Properties of the Wheaton soil—

Permeability: Moderate
Available water capacity: High
Depth to bedrock: More than 5 feet
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have few limitations if used for building site development and are well suited to lawns, shade and ornamental trees, shrubs, vines, and gardens. Areas that have been very deeply excavated are generally droughty and thus are poorly suited to most types of vegetation. The unit has only fair potential for most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

67UB—Urban land-Wheaton complex, 0 to 8 percent slopes. This unit consists of a Urban land intermingled with a very deep, well drained Wheaton soil. The Wheaton soil has been graded, cut, filled, or otherwise disturbed during urbanization. The unit is in highly urbanized areas on uplands. Areas are about 5 to 50 acres in size. They are about 50 to 75 percent Urban land and 25 percent Wheaton soil. The Urban land and Wheaton soil occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Wheaton soil are as follows—

Surface layer:
0 to 6 inches, very dark grayish brown silt loam

Substratum:
6 to 13 inches, strong brown loam
13 to 20 inches, brown loam
20 to 38 inches, strong brown loam
38 to 68 inches, yellowish red loam

Included in this unit in mapping are small areas of Glenville and Baile soils on the lower parts of the landscape. Some of these areas have been covered by fill. Also included are small, generally convex areas of Brinklow and Blocktown soils and a few areas where bedrock is exposed. Included areas make up as much as 15 percent of the unit.

Properties of the Wheaton soil—

Permeability: Moderate
Available water capacity: High
Depth to bedrock: More than 5 feet
Potential for frost action: Moderate

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other structures.

Yards, open areas between buildings and streets, and other areas that have not been urbanized have few limitations if used for building site development and are well suited to lawns, shade and ornamental trees, shrubs, vines, and gardens. Areas that have been very deeply excavated are generally droughty and thus are poorly suited to most types of vegetation. The unit has only fair potential for most recreational uses because of limited open space. Onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

100—Dumps, refuse. This unit consists of areas used for trash disposal. It is in scattered areas throughout the county. Dumps are commonly called landfills or sanitary landfills. They consist mostly of trash from residential and commercial areas. The trash is largely composed of paper, cans, plastic, and bottles and is covered daily with soil material. A few dumps include industrial waste, tree stumps, concrete, and debris from demolished buildings.

Onsite investigation is needed before decisions about alternative land uses are made. A few dumps have been used as industrial sites. One of the major factors affecting land use is the liquid that percolates through the material in the dumps.

No capability classification is assigned.

109D—Hyattstown channery silt loam, 15 to 25 percent slopes, very rocky. This soil is shallow and well drained. It is on side slopes in the uplands. Areas range from 5 to 75 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, dark grayish brown channery silt loam

Subsoil:
9 to 14 inches, yellowish brown very channery silt loam
14 to 18 inches, brown extremely channery silt loam

Bedrock:
18 to 26 inches, weathered phyllite that crushes to extremely channery clay loam
26 inches, hard phyllite

Included with this soil in mapping are Linganore soils on the lower parts of side slopes. Also included are Baile soils along drainageways. Included soils make up as much as 10 percent of the unit. Also included, on knolls and the upper side slopes, are rock outcrops, which make up 1 to 10 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Very low
Depth to bedrock: 10 to 20 inches
Hazard of erosion: Moderate

Most areas are used as woodland or pasture. Woodland species include chestnut oak and red oak.

This soil is poorly suited to cultivated crops and hay. The main limitations are the rock outcrops and the slope.

This soil generally is suited to pasture. In areas that are free of rock outcrops, it is well suited to pasture. The rock outcrops hinder the equipment used for pasture renovation and other management practices.

Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The rock outcrops and the slope are the main management concerns. They restrict the use of planting and harvesting equipment. The hazard of windthrow is severe because of the rock outcrops and the shallowness of the Hyattstown soil. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce this hazard.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping help to overcome the slope.

The depth to bedrock, the rock outcrops, the slope, and the potential for frost action are the main limitations on sites for local roads and streets. In many areas the bedrock can be ripped by machinery. Constructing the roads on the contour and land shaping and grading help to overcome the slope. Providing coarse grained subgrade of base material helps to prevent the damage to pavement caused by frost action.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is IVe.

109E—Hyattstown channery silt loam, 25 to 45 percent slopes, very rocky. This soil is shallow and well drained. It is on side slopes in the uplands. Areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 9 inches, dark grayish brown channery silt loam

Subsoil:
9 to 14 inches, yellowish brown very channery silt loam
14 to 18 inches, brown extremely channery silt loam

Bedrock:
18 to 26 inches, weathered phyllite that crushes to extremely channery clay loam
26 inches, hard phyllite

Included with this soil in mapping are Linganore soils on the lower parts of side slopes and Baile soils along drainageways. Included soils make up as much as 10 percent on the unit. Also included, on knolls and the upper side slopes, are rock outcrops, which make up 1 to 10 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Very low
Depth to bedrock: 10 to 20 inches
Hazard of erosion: Severe

Most areas are used as woodland.

This soil is unsuited to cultivated crops and hay. The main limitations are the rock outcrops and the slope.

This soil is poorly suited to pasture. The rock outcrops and the slope hinder the equipment used for pasture renovation and other management practices. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The rock outcrops and the slope are the main management concerns. They restrict the use of planting and harvesting equipment. The hazard of windthrow is severe because of the rock outcrops and the shallowness of the Hyattstown soil. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce this hazard.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for dwellings. The better suited soils on uplands should be selected.

The slope is the main limitation on sites for local roads and streets. Constructing the roads on the contour and land shaping and grading help to overcome this limitation.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is VIIe.

116C—Blocktown channery silt loam, 8 to 15 percent slopes, very rocky. This soil is shallow and well drained. It is on side slopes in the uplands. Areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 6 inches, yellowish red channery silt loam

Subsoil:
6 to 17 inches, red extremely channery silt loam

Bedrock:
17 to 21 inches, variegated red and yellowish red, soft bedrock that crushes to extremely channery silt loam
21 inches, hard phyllite

Included with this soil in mapping are Brinklow soils on the concave lower parts of side slopes and the poorly drained Baile soils in swales and along drainageways. Included soils make up as much as 15 percent of the unit. Also included, on knolls and the upper side slopes, are rock outcrops, which make up 1 to 10 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Very low
Depth to bedrock: 10 to 20 inches

Most areas are used as woodland or pasture. Woodland species include red oak and chestnut oak.

This soil is poorly suited to cultivated crops and hay. The main limitations are the rock outcrops and the slope.

This soil generally is suited to pasture. In areas that are free of rock outcrops, it is well suited to pasture. The rock outcrops hinder the equipment used for pasture renovation and most other management practices. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. Seedling mortality is a moderate hazard because of the very low available water capacity. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The hazard of windthrow is severe. The use of special equipment that does not damage surficial root systems during selective cutting operations can reduce this hazard.

The depth to bedrock and the rock outcrops are the main limitations on sites for dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The depth to bedrock and the rock outcrops are the main limitations on sites for local roads and streets. In many areas the bedrock can be ripped by heavy machinery.

The capability subclass is IIIe.

116D—Blocktown channery silt loam, 15 to 25 percent slopes, very rocky. This soil is shallow and well drained. It is on side slopes in the uplands. Areas range from 5 to 100 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 6 inches, yellowish red channery silt loam

Subsoil:
6 to 17 inches, red extremely channery silt loam

Bedrock:
17 to 21 inches, variegated red and yellowish red, soft bedrock that crushes to extremely channery silt loam
21 inches, hard phyllite

Included with this soil in mapping are Brinklow soils in concave areas on the lower parts of side slopes and Baile soils along drainageways. Included soils make up as much as 15 percent of the unit. Also included, on knolls and the upper side slopes, are rock outcrops, which make up 1 to 10 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Very low
Depth to bedrock: 10 to 20 inches
Hazard of erosion: Moderate

Most areas are used as woodland or pasture. Woodland species include red oak and chestnut oak.

This soil is generally unsuited to cultivated crops and hay. The main limitations are the rock outcrops and the slope.

This soil generally is suited to pasture. In areas that are free of rock outcrops, it is well suited to pasture. The rock outcrops hinder the equipment used for pasture renovation and other management practices. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concerns are the moderate hazard of erosion, an equipment limitation, and seedling mortality, which are caused by the slope and the rock outcrops. The rate of seedling mortality can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains. The hazard of windthrow can be reduced through the use of special equipment that does not damage surficial root systems during selective cutting operations.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for dwellings. Designing the buildings so that they conform to the natural slope of the land and land shaping help to overcome the slope.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for local roads and streets. In many areas the bedrock can be ripped by heavy machinery. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The depth to bedrock, the slope, and the rock outcrops are the main limitations on sites for septic tank absorption fields. The better suited soils on uplands should be selected.

The capability subclass is IVe.

116E—Blocktown channery silt loam, 25 to 45 percent slopes, very rocky. This soil is shallow and well drained. It is on side slopes in the uplands. Areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
0 to 6 inches, yellowish red channery silt loam

Subsoil:
6 to 17 inches, red extremely channery silt loam

Bedrock:
17 to 21 inches, variegated red and yellowish red, soft bedrock that crushes to extremely channery silt loam
21 inches, hard phyllite

Included with this soil in mapping are Brinklow soils on the concave lower parts of side slopes and Baile soils along drainageways. Included soils make up as much as 15 percent of the unit. Also included, on knolls and the upper side slopes, are rock outcrops, which make up 1 to 10 percent of the unit.

Soil properties—

Permeability: Moderate
Available water capacity: Very low
Depth to bedrock: 10 to 20 inches
Hazard of erosion: Severe

Most areas are used as woodland. Woodland species include red oak and chestnut oak.

This soil is unsuited to cultivated crops and hay. The main limitations are the rock outcrops and the slope.

This soil is poorly suited to pasture. The rock outcrops and the slope hinder the equipment used for pasture renovation and other management practices. Grazing during wet periods results in compaction of the surface layer. Overgrazing reduces the quantity and quality of the forage. Deferring and rotating grazing as needed, applying lime and fertilizer, and controlling weeds and brush increase the quantity and quality of feed and forage.

The potential productivity for trees on this soil is moderately high. The main management concerns are the severe hazard of erosion, an equipment limitation, and windthrow, which are caused by the slope and the rock outcrops. The hazard of windthrow can be reduced through the use of special equipment that does not damage surficial root systems during selective cutting operations. Seedling mortality is a moderate hazard. This hazard can be reduced by planting seedlings in early spring, when they can obtain sufficient moisture from spring rains.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for dwellings and septic tank absorption fields. The better suited soils on uplands should be selected.

The depth to bedrock, the rock outcrops, and the slope are the main limitations on sites for local roads and streets. In many areas the bedrock can be ripped by machinery. Constructing the roads on the contour and land shaping and grading help to overcome the slope.

The capability subclass is VIIe.

200—Pits, gravel. This unit consists of areas that have been excavated for sand or gravel. It is mostly on broad outwash plains and the terraces of stream valleys. It supports sparse vegetation consisting of drought-resistant plants. Areas generally range from 3 to 30 acres in size. Slopes range from 0 to 25 percent. Steep escarpments are along the edges of the pits.

Onsite investigation is needed before decisions about alternative land uses are made.

No capability classification is assigned.

201—Pits, quarry. This unit consists of areas that have been excavated for rock used in road building or other kinds of construction. It is mainly in bedrock-controlled areas. Areas range from 3 to 50 acres in size. Slopes are mostly 0 to 3 percent. Escarpments are along the edges of the pits.

Onsite investigation is needed before decisions about alternative land uses are made.

No capability classification is assigned.

300—Rock outcrop-Blocktown complex. This unit consists of areas dominated by exposed bedrock and detached boulders and stones. The Blocktown soil is between the areas of rock. It supports a sparse stand of

Figure 9.—An area of Rock outcrop-Blocktown complex along the Potomac River, near Great Falls. The exposed bedrock is schist.

trees and brush. The unit is mainly along the Potomac River from Great Falls to the lower end of Bear Island (fig. 9). A few scattered areas are in the northwestern part of the county. Slopes generally are 8 to 50 percent, but in a few areas they are 3 to 8 percent. About 70 percent of the unit is Rock outcrop, and 20 percent is Blocktown channery silt loam. The Rock outcrop and Blocktown soil occur as areas so closely intermingled that mapping them separately is not practical.

The typical sequence, depth, and composition of the layers in the Blocktown soil are as follows—

Surface layer:
0 to 6 inches, yellowish red channery silt loam

Subsoil:
6 to 17 inches, red extremely channery silt loam

Bedrock:
17 to 21 inches, variegated red and yellowish red, soft bedrock that crushes to extremely channery silt loam
21 inches, hard phyllite

Included in this unit in mapping are very shallow soils that are similar to the Blocktown soil but have bedrock at a depth of 5 to 10 inches. Also included are some areas of Blocktown soils that have a cobbly or stony surface and, adjacent to the Potomac River, a few areas of soils are that shallow or moderately deep, are excessively drained, and have a texture of sandy loam or loamy sand. Included soils make up about 10 percent of the unit.

Properties of the Blocktown soil—

Permeability: Moderate
Available water capacity: Very low
Depth to bedrock: 10 to 20 inches
Hazard of erosion: Moderate

Most areas are used as woodland. Virginia Pine is the dominant species, but hardwoods, such as red oak, chestnut oak, and hickory, also are in the stands. A few areas at Great Falls cannot support trees because they are too rocky. These areas are used mainly for recreational purposes and wildlife habitat.

The high percentage of exposed bedrock, the shallowness to bedrock, and the slope severely limit urban development.

The capability subclass is VIIIs in areas of the Blocktown soil.

400—Urban land. This map unit consists of areas where more than 75 percent of the surface is covered by asphalt, concrete, buildings, or other structures. Examples are parking lots, shopping and business centers, and industrial parks. The unit is on the Coastal Plain and in the Piedmont. It is in scattered areas throughout the county. Slopes are nearly level to moderately sloping. Areas generally range from 2 to more than 1,000 acres in size. The largest areas are near downtown business districts and along the main roads.

Included in mapping are large areas that are mostly miscellaneous fill. In many areas several feet of this fill has been placed over streams, swamps, and flood plains. These areas are now almost totally covered with roads, buildings, or other structures. Also included are a few strongly sloping and steep areas.

Examination and identification of the soils in areas of this unit are impractical. Careful onsite investigation is needed to determine the potential for any proposed land use and the limitations affecting that use.

No capability classification is assigned.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban or built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 105,400 acres in the survey area, or nearly 33 percent of the total acreage, meets the soil requirements for prime farmland. This land is mainly in the central part of the county.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

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 to prevent soil-related failures in land uses.

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

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

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

In this section, the estimated yields of the main crops and hay and pasture plants are listed and the system of land capability classification used by the Natural Resources Conservation Service is explained.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Montgomery County Cooperative Extension Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification also is shown in the table.

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

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

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

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or the Montgomery County Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Management of Soils in Urban Areas

Ennis Dodd, extension agent, Montgomery County Cooperative Extension Service, helped prepare this section.

This section describes the characteristics of soils in urban areas and the management needed to ensure the ability of these soils to support plants.

Physical and Chemical Characteristics

The physical characteristics of soils in urban areas are distinctly different from the characteristics of natural soils. The chemical characteristics vary. The best measurement of the physical characteristics of soils in an urban area is bulk density. Bulk density indicates soil moisture and soil atmosphere relationships, thermal conductibility, the percentage of pore space, and the ability of plant roots to adequately penetrate the soil. When the soil becomes highly compacted, it is often droughty.

Other characteristics of these soils are heterogeneity from area to area, variability in content of organic matter with increasing depth, disoriented coarse fragments (rocks and stones), highly variable fertility and reaction, and wide variation in textural distribution (percentages of sand, silt, and clay) with increasing depth.

Soil Compaction

Soil compaction can be severe in urban areas. Severe compaction can result in poor plant establishment. In their natural state soils are made up ideally of four principal volume fractions—about 45 percent mineral material (sand, silt, and clay), about 5 percent organic matter (decayed or decaying plant parts, soil organisms, and other biological material), about 25 percent soil atmosphere (a mixture of nitrogen, oxygen, and carbon dioxide), and 25 percent soil moisture. As depth in the natural soil increases, the content of oxygen decreases and the content of carbon dioxide increases.

Similarly, within the soil atmosphere of a compacted soil, there is an inverse relationship between oxygen and carbon dioxide. The content of oxygen can decrease to 1 percent or less in extreme cases, and the content of carbon dioxide can increase to 19 percent or more. These extreme conditions can result from a number of activities or events, such as paving over a soil surface, placing a layer of clay on the surface, heavy use, and flooding. Any one of these can result in a change from a desired high-oxygen soil atmosphere to an undesirable low-oxygen one. Plants generally are vigorous if the soil is high in content of oxygen, and they tend to decline in vigor as the content of oxygen decreases. A lack of oxygen, whether caused by compaction, sealing of the surface, or flooding, can limit plant growth. Improving this condition commonly is very expensive and difficult. In some areas of mature trees, improving the condition is nearly impossible because of the number of roots in the soil.

Soil Amendments

In flower beds and on lawns, compacted conditions can be most easily altered by various soil amendments. The most realistic approach is the incorporation of amendments into the soil prior to planting. The amendments should increase the content of organic matter in the soil and help to overcome the long-term deleterious effects of compaction. In many areas organic mulch can be added as needed to increase or maintain the content of organic matter and thus gradually improve the soil. It helps to maintain good tilth and fertility and minimizes compaction.

Soils in urban areas require modification to increase the volume of pore space and thus improve the soil atmosphere and moisture relationships. With increasing bulk density, there is a direct reduction of the pore space and a serious alteration of the soil atmosphere. The soil atmosphere tends toward a low-oxygen environment as opposed to the more desirable high-oxygen condition. Low-oxygen conditions can severely stress and often kill plants. Several soil amendments, organic and inorganic, have been used successfully to increase pore space and improve the soil atmosphere. The organic amendments used to improve soils include compost (aerobically composted sewage sludge and wood chips), leaf mold, wood chips, peat moss, sphagnum, and bark chips. The inorganic amendments include expanded slate, coarse construction sand, and similar materials. Each type of soil amendment has its use, and all of them are added primarily to improve the pore space relationships within the soil and to reduce the effects of compaction.

Normally, maintaining an organic matter content of at least 5 percent is desirable. The inorganic soil amendments are usually added on a soil volume basis of 20 to 30 percent. For some uses, such as athletic fields, coarse sand has been used to make up 99 percent of the "soil" mantle. This type of soil amendment requires substantial management and corresponding economic support. Once incorporated into the surface layer, the inorganic amendments should continue to minimize compaction for years.

Landscaping and Gardening

Many of the soils in the urban areas in Montgomery County have been disturbed to some degree during excavation for utilities and building foundations and during the construction of roads and walks. The soils in Urban land complexes and in cut and filled areas have been especially disturbed. Wood, brick, gypsum board, metal stripping, mortar, and other items are commonly thrown or dumped around the foundation while a building is under construction. These items later find their way into the backfill around the foundation.

Practically all of the soils in the county are acid and are generally suitable for acid-tolerant plants, such as azaleas and rhododendron. These plants are commonly established very close to foundations, where the natural soil reaction is most likely to have been severely altered during construction. As a result, a soil reaction (pH) test is needed in areas around foundations and in other severely disturbed areas.

The publication "The Yearbook of Agriculture—Landscape for Living" covers many aspects of landscaping in urban areas, especially the effects of heat from pavements, salt, shade, and microclimates in individual yards *(5)*. This book is available in most pubic libraries.

Selecting Plant Materials

The factors that should be considered before plant materials for landscaping in Montgomery County are selected include shade, wetness, a restricted root zone, compaction, the damage to plants caused by salt, and air pollution.

Shade.—Any map unit that is dominated by Urban land has a high density of buildings. What little areas of soil are available between or around the buildings may be in shade much of the day. Many of the most common flowers and vegetables grow poorly. The most heavily shaded areas are those close to foundations. These areas also are subject to extreme physical and chemical disturbance during construction. In areas of the Urban land complexes, careful observation of shade patterns and chemical analysis of the soils are needed before plants are selected. Lime is seldom needed in shaded areas because practically all shade-tolerant plants thrive in acid soils. Examples of these plants are rhododendron, holly, Oregon hollygrape, azalea, laurel, leucothoe, Andromeda, and dogwood. Regardless of the kind of soil, additions of sphagnum moss and humus improve the growth of the shade-tolerant plants. The roots, stems, fruits, and leaves of black walnut trees are toxic to some other plants, such as rhododendron. Shallow-rooted trees may draw moisture away from other plants.

Wetness.—Except for ferns and mosses, most plants do not thrive in wet soils. Measures that overcome the wetness are needed. A subsurface drainage system can be effective if the soil is permeable enough for excess water to move through the soil to the drainage tile. The wetness also can be reduced by planting on raised beds of suitable fill material, which can provide a satisfactory root zone. In some low areas measures that control the runoff from the adjacent slopes are needed. Reducing wetness is difficult in some areas because of property line restrictions that limit the management alternatives.

A restricted root zone.—Generally, soils that have a restricted root zone do not hold enough moisture for plants throughout the growing season. In urban areas many root-restricting factors that cause failures or poor growth characteristics are not suspected until an investigation discloses impermeable barriers, such as chunks of asphalt or concrete that have been covered by soil material because of grading and filling or because of erosion through the years.

During construction, dense, compact layers in the subsoil may have been exposed or left within a few inches of the surface. Shrubs, lawn grasses, trees, and gardens planted under these conditions are likely to grow poorly. Roots cannot penetrate the dense layers, and therefore the plants have a very limited amount of available moisture during dry periods and are susceptible to frost heaving during periods of freezing and thawing. Also, tilling the exposed subsoil is very difficult because it is excessively clayey or compact. Runoff or seepage from these soils can reach driveways and walks, causing wet, messy conditions during warm periods and ice hazards in winter.

Where root-restricting layers are near the surface, the root zone can be thickened by adding topsoil and by mixing highly decomposed organic matter into the soil so that it makes up as much as 50 percent of the volume. This measure also increases the available water capacity of the soil.

Compaction.—A noncompacted soil that has good structure is about 50 percent mineral material and 50 percent pore space. In a highly compacted soil, the pore space has been greatly reduced by the weight of machinery or foot traffic, which forces mineral soil solids into the pore space. As a result, the soil holds less air and water and is less permeable.

Any soil that is either naturally compact or has been mechanically compacted provides a very poor environment for roots, which is reflected in the poor quality of the part of the plant above ground. Some of the poorest mediums for plant growth are soils of the Beltsville and Glenville series in areas where grading has removed the surface layer, exposing the dense, firm subsoil, which restricts root penetration; absorbs little, if any, rainfall; and causes excessive runoff. These conditions are extensive where the soils are in Urban land complexes. Every effort should be made to incorporate organic matter into at least the upper 12 inches of a compacted soil and then to keep the surface well covered with mulch, which helps to prevent the compaction caused by foot traffic. The mulch can be pine bark, wood chips, or other locally available material.

Plant damage caused by salt.—Extraneous salt used to deice walks, driveways, city streets, and highways can damage plants. This damage should be suspected wherever a plant is within splash distance of streets and gutters or where runoff from driveways and walks flows onto or over the planted area.

The symptoms of salt damage are the same as those of drought, root rot, and potassium deficiency. On trees, shrubs, and vines, burns develop on the tips or margins of leaves. The burned leaves often drop off the plant. The dropping of the leaves may be followed by the dieback of stems and the eventual death of the plants. The leaves, stems, flowers, and fruits of nonwoody plants are generally smaller than those of woody plants. Stunting and, in extreme cases, death are usually the only observable effects on most nonwoody plants. Shrubs that are sensitive of salt include Algerian ivy, azalea, barberry, winged euonymus, Beuford holly, rose (except for Rosa rugosa), and witchhazel. Trees that are tolerant of salt include callery pear (such as 'Bradford' pear), london plane tree, sycamore, white spruce, sweetgum, poplar, and willow.

Salt in water draining off highways and streets may be so highly concentrated that no plant commonly growing in the survey area can survive. Some plants are more tolerant of salt than others. Bermudagrass can tolerate salt concentrations about 10 times greater than those tolerated by the most sensitive species, such as African violet, rose, and strawberry. Most shrubs are moderately tolerant of salt. The most sensitive include Algerian ivy, Beuford holly, and rose. Black locust and honeylocust are examples of salt-tolerant trees. Ponderosa pine, eastern redcedar, white oak, red oak, spreading juniper, and arborvitae are moderately tolerant. Blue spruce and white pine are relatively sensitive.

If salt damage is suspected, leaching can reduce the concentration of salt to a level that is not injurious to the plants. Leaching occurs when more water is applied to the planted area than can evaporate or be used by the plant. If the excess water can drain away below the roots, it will carry with it the unwanted excess salt. Leaching is effective in some soils but not in others. It is reasonably effective in the well drained soils of the Croom, Gaila, Glenelg, Legore, Occoquan, and Wheaton series. Good internal drainage is needed, and the area to be leached should not be severely compacted. In areas of the more slowly permeable soils, such as those of Baile, Beltsville, Elioak, and Glenville series, the salt may be leached into a slowly permeable subsoil, where it is likely to precipitate out and accumulate in the root zone.

Detecting salt damage can be difficult. The plants that are most susceptible to salt damage, such as those at intersections, in traffic circles, and along corner sidewalks, also are most susceptible to heavy pedestrian traffic and trampling. Careful investigation is needed to determine whether the plant damage is caused by salt or by pedestrian traffic.

Air pollution.—Air pollution can seriously damage many ornamental plants. The symptoms of this pollution may be mistaken for those caused by diseases, insects, or soil limitations.

The most pernicious pollutants in Montgomery County are ozone and peroxyacetal nitrate, both of which are photochemical oxidants. In the presence of sunlight, ozone forms when nitrogen oxides in the air react with oxygen and peroxyacetal nitrate forms through the chemical combination of nitrogen oxides with hydrocarbons in the atmosphere. The symptoms of these pollutants include spotted, streaked, and bleached leaves; retarded plant growth; and early leaf drop.

Among the annuals most sensitive to ozone are geranium, petunia, and wax begonia. Coleus, sultana, and garden verbena show only intermediate sensitivity. The annuals susceptible to the damage caused peroxyacetal nitrate include China aster, petunia, and sultana. Those that are relatively resistant to this damage include balsam, calendula, coleus, Madagascar periwinkle, and wax begonia.

As a general rule, small-leaved plants are more resistant to air pollutants than large-leaved plants. Also, slowly growing plants are more resistant than rapidly growing plants that have soft tissues.

Air pollution affects the plants more than it affects the soils in which the plants grow. It cannot be directly correlated with kinds of soil unless a specific soil coincidentally occurs in an area of maximum air pollution. This coincidental correlation does not occur in Montgomery County.

Flower and Vegetable Gardens

A good garden requires a nearly level or gently sloping, loamy, permeable soil that is adequately aerated and has a moderate or high available water capacity. The pH generally should be between 6.0 and 7.0.

Compared to gardens in more open areas, inner-city gardens are more likely to be detrimentally influenced by the shade cast by buildings, by overhanging tree canopies, by the root systems of nearby trees, and by shrubs sapping moisture away from the garden area during critical dry periods. On the other hand, many of the inner-city gardens benefit from better access to irrigation water, which can be provided by hydrants and by spigots at dwellings, and are less susceptible to killing frosts in spring and fall than gardens in the more open areas. Air pollution damages the garden plants in some areas.

Those interested in participating in a community gardening program can contact the Montgomery County Recreation Department.

Vines and Ground Cover

A plant cover is needed in many urban areas. Because of topography, shade, or other factors, however, growing grasses may not be practical. Even if grasses can be grown, some other kind of plant cover may be more practical.

The plants selected for ground cover should be those that can grow under the adverse conditions to which they may be subjected. The best plants are those that can grow rapidly enough to cover and protect the area, that can be easily propagated, and that generally are low growing and are not seriously injured if subject to foot traffic.

Public libraries and the Montgomery County Cooperative Extension Service can provide information about the more common vines and ground cover plants that can tolerate special conditions, such as shade, exposure to sunlight, and steep slopes. These are especially important considerations in areas of Urban land complexes, where multistory buildings may provide shade during most of the day or where steep, dry slopes have resulted from intensive grading and excavation.

Planting Trees and Shrubs

Before a shrub or tree can begin to grow, it must first be planted in a manner that permits survival. Site preparation before planting is more critical in severely disturbed urban areas than in the less disturbed rural or suburban areas.

In soil complexes dominated by Urban land, the original soil material commonly has been graded, cut, filled, compacted, or all of these. Also, the soils may have been chemically altered by salts, oil, lime, or other elements of the building trade. Backfilling around the root system with good hauled-in topsoil reduces the risk of losing an expensive ornamental plant in these areas and ensures that the roots have a good moisture-holding medium around them while the tree or shrub is becoming established.

Trees and Shrubs for Noise Abatement

Noise from moderate-speed car traffic in urban areas can be reduced by planting trees and shrubs in belts that are 20 to 50 feet wide. The edge of the belt should be 20 to 50 feet from the center of the nearest traffic lane. Shrubs 6 to 8 feet tall should be established next to the traffic lane. They should be backed up by rows of trees 15 to 30 feet tall.

For the best results, the trees and shrubs should be planted close to the source of the noise and should be evergreens or deciduous varieties that retain their leaves during most of the year. Widely spaced trees and trees that are in poor condition as a result of neglect or an unfavorable environment offer little resistance to noise.

Knowledge of out-of-door sound propagation is necessary before valid judgments about growing trees and shrubs as sound barriers can be made. Once the general requirements are known, the species that are suited to the kind of soil at the location can be selected for planting.

Lawn Grasses

Montgomery County is in the heart of a crabgrass belt, which is a transition zone between areas of warm-season grasses and areas of cool-season grasses. Neither warm-season nor cool-season grasses grow especially well, but the turf grower has the opportunity to include both warm- and cool-season grasses in lawns. The following paragraphs describe several of the factors that affect the growth of lawn grasses in the county.

Grasses in shaded areas.—A lower intensity of light and the trees that compete with grasses for water and nutrients complicate growing turf in shaded areas. The structures that provide shade commonly restrict air movement or drainage and thereby create humid, disease-favoring conditions. Lawns in the shaded areas benefit from more moderate temperatures.

Where the landscape plan calls for turf in shaded areas, the effect of shade should be minimized by removing unnecessary trees, pruning the remaining trees so that as much light as possible reaches the lawn, immediately removing fallen leaves and branches, and otherwise applying good management. This management is especially necessary in areas of the Urban land complexes, where buildings provide much shade. Good management includes selecting shade-tolerant grasses for planting, using minimum amounts of nitrogen when trees are in leaf but maintaining an adequate level of nutrients in the soil for both trees and grasses, maintaining a nearly neutral reaction, irrigating deeply but infrequently, and applying fungicide as needed.

Grasses in sunny areas.—The problems of the transition zone are most apparent in these areas. A wide range of grasses can be grown, including warm-season grasses, such as bermudagrass and zoysia, and cool-season grasses, such as bluegrass, bentgrass, fine fescue, and coarse fescue.

Grasses for visual effect.—Lawns that are maintained for visual effect can be divided into two groups—those seen from a low angle from a distance and those seen from a high angle at close range. For the first group any species that can be mowed and can control erosion is satisfactory. The second group generally includes lawns in which every blade of grass can be seen. Traffic is usually minimal on these lawns. In sunny areas, where high temperatures are anticipated, zoysia and the more slowly growing varieties of bermudagrass are suitable.

Grasses in heavily used areas.—Heavy traffic damages the grasses and results in soil compaction, which excludes air and water from the root zone. The shortcut or path is one of the most common of the areas that are subject to heavy traffic. In these areas serious consideration should be given to paving a walkway on a smaller scale. Stepping stones or gravel walks commonly are sufficient. Also, consideration should be given to redesigning the areas so that traffic will be diverted to the existing paved walks. In relatively sheltered areas where wind erosion is not a hazard, wood chips can be used.

If turf is desired in the larger of the heavily used areas, such as ball fields and playgrounds, wear-resistant grasses and measures that prevent excessive compaction are needed. A reaction of nearly neutral and adequate levels of phosphate and potash should be maintained. Also, moderate amounts of nitrogen should be applied, so that plant growth is vigorous but not lush. The measures that prevent excessive compaction include soil amendments and mechanical treatment that loosens the soil, such as vertical slicing and aeration.

Specific recommendations about establishing lawn grasses can be provided by the Montgomery County Cooperative Extension Service.

Woodland Management and Productivity

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 gives the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, that the indicator species can produce. The larger the number, the greater the potential productivity. The number 1 indicates low productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 or more, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *R* indicates steep slopes; *X*, stones or rocks on the surface; *W*, excess water in or on the soil; *T*, excessive alkalinity, acidity, sodium salts, or other toxic substances in the soil; *D*, restricted rooting depth caused by bedrock, a hardpan, or other restrictive layers; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, high content of rock fragments in the soil. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that erosion can occur as a result of site preparation or cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed also are subject to erosion. Ratings of the erosion hazard are based on the percent of the slope and on the erosion factor K shown in table 16. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities. The proper construction and maintenance of roads, trails, landings, and fire lanes can reduce the erosion hazard.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. If soil wetness is a factor, equipment use is restricted for a period of less than 2 months. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If soil wetness is a factor, equipment use is restricted for 2 to 6 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment or the season of use. If soil wetness is a factor, equipment use is restricted for more than 6 months. Choosing the best suited equipment and deferring the use of harvesting equipment during wet periods help to overcome the equipment limitation.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil or topographic conditions. The factors considered in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, rooting depth, and aspect of the slope. A rating of *slight* indicates that under usual conditions the expected mortality is less than 25 percent. A rating of *moderate* indicates that the expected mortality is 25 to 50 percent. Extra precautions are advisable. A rating of *severe* indicates that the expected mortality is more than 50 percent. Extra precautions are important. Replanting may be necessary. Selection of special planting stock and special site preparation, such as bedding, furrowing, and installing a surface drainage system, can reduce the seedling mortality rate.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees but do not uproot them. A rating of *moderate* indicates that a few trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods. The use of special equipment that does not damage surficial root systems during partial cutting operations can reduce the hazard of windthrow. Care in thinning or not thinning at all also can reduce the hazard.

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 a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, represents an expected volume produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand. One cubic meter per hectare equals 14.3 cubic feet per acre.

The first species listed under *common trees* for a soil is the indicator species for that soil. This species is common in the survey area. It generally is the most productive species on the soil. The productivity class of the indicator species is the number in the ordination symbol.

Trees to plant are those that are suitable for commercial wood production on the soil.

Recreation

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

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

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 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

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 10, 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 flooding. 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, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, timothy, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggartick, quackgrass, and ragweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood, 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, yew, cedar, and hemlock.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, arrowhead, pickerelweed, cordgrass, 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, swamps, and ponds (fig. 10).

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. Wildlife attracted to these areas include bobwhite quail, meadow vole, 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, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, 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, frogs, and tree swallow.

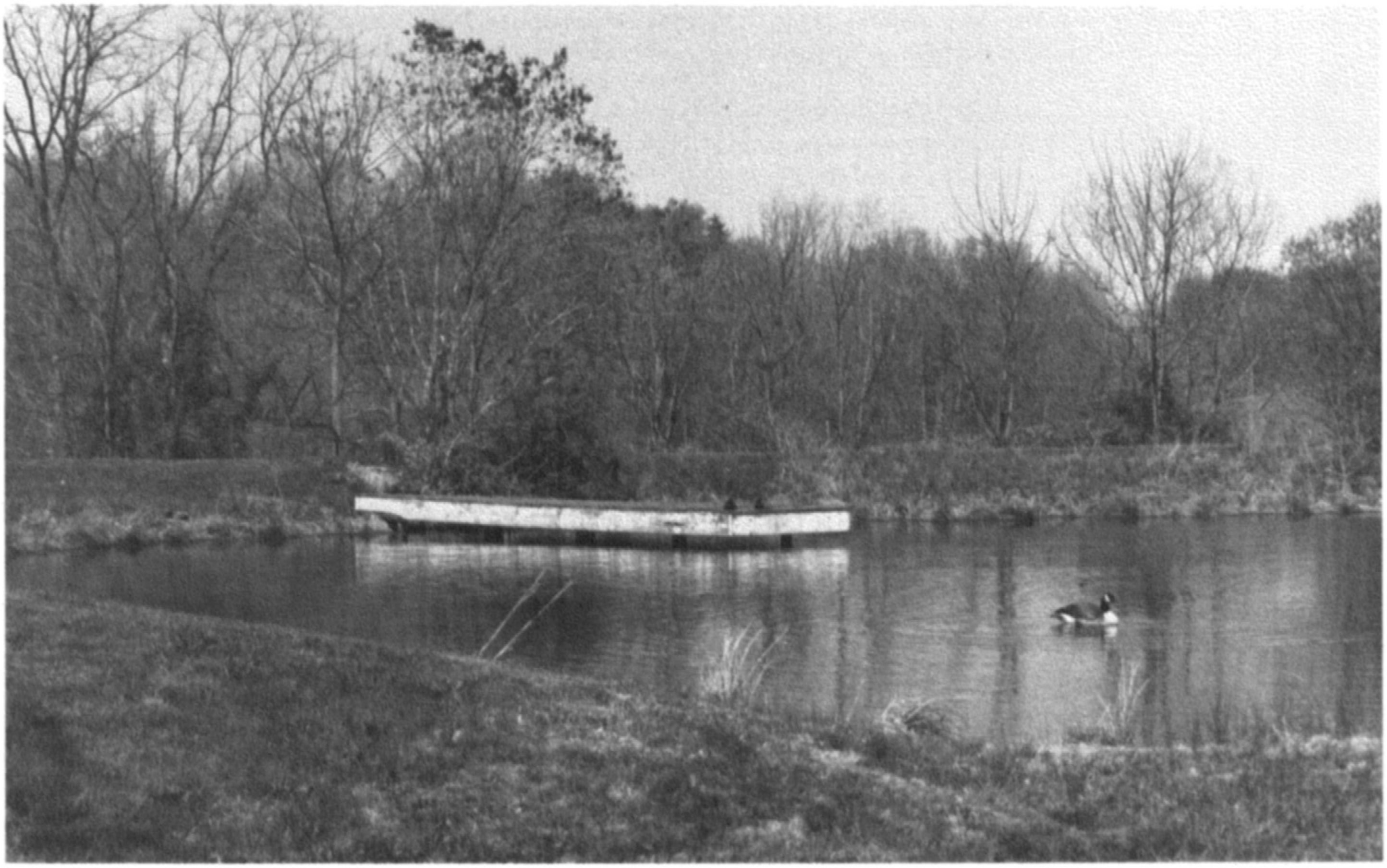

Figure 10.—A recreational pond that provides excellent habitat for wetland wildlife.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the 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 evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

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

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

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

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

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 should be considered.

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

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

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 wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. 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 to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have 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 have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high 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 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

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

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

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion 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

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

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

Engineering Index Properties

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

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

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

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

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

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

Physical and Chemical Properties

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

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, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓-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 and septic tank absorption fields.

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

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, 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 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 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 infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

Soils in table 17 may be assigned to two hydrologic groups. Dual grouping is used for one of two reasons. Some soils have a seasonal high water table but can be drained. In this instance, the first letter is for drained areas and the second is for undrained areas. For some soils that are less than 20 inches deep over bedrock, the first letter is for areas where the bedrock is cracked and pervious and the second is for areas where the bedrock is impervious or where exposed bedrock makes up more than 25 percent of the surface.

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.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides (fig. 11). Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

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 little or no horizon development.

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 estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are depth to the seasonal high water table; the

Figure 11.—Flooding caused by an overflowing stream in an area of Hatboro silt loam, 0 to 3 percent slopes, frequently flooded.

kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17. Only saturated zones within a depth of about 6 feet are indicated.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(6)*. 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 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

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 *ent*, from Entisol).

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 Fluvaquents (*Fluv*, meaning river, plus *aquent*, the suborder of the Entisols that has 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 Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, nonacid, mesic Typic Fluvaquents.

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, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(7)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(6)*. 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."

Baile Series

The soils of the Baile series are fine-loamy, mixed, mesic Typic Ochraquults. They are very deep and poorly drained. They formed in local alluvium and in the underlying material weathered mainly from mica schist and gneiss. They are in depressions and along drainageways in the uplands. Slopes range from 0 to 3 percent.

Typical pedon of Baile silt loam, 0 to 3 percent slopes, about 2 miles northwest of Olney, about 400 feet east on State Route 108 from its intersection with Zion Road and 190 feet south:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

Btg—8 to 31 inches; gray (N 5/0) silt loam; many medium prominent yellowish red (5YR 5/8) mottles; strong medium platy structure parting to moderate medium and coarse subangular blocky; friable; few fine roots; common fine tubular pores; many prominent clay films on faces of peds and lining pores; strongly acid; clear wavy boundary.

BCg—31 to 40 inches; gray (N 5/0) and dark gray (N 4/0) loam; many coarse prominent yellowish brown (10YR 6/8) mottles; weak medium platy structure; friable; few fine roots; about 5 percent gravel; very strongly acid; clear wavy boundary.

Cg—40 to 62 inches; greenish gray (5BG 6/1) loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; few fine roots; about 5 percent gravel; strongly acid.

The thickness of the solum ranges from 24 to 40 inches. The depth to bedrock ranges from 5 to 10 feet. The content of gravel ranges from 0 to 5 percent in the B and C horizons. In unlimed areas reaction is strongly acid to extremely acid.

The A or Ap horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 2 to 6 and chroma of 0 to 2. Value of 2 or 3 is confined to an undisturbed A horizon that is less than 6 inches thick.

The B horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is loam, silt loam, or silty clay loam in the fine-earth fraction.

The Cg horizon is strongly gleyed and commonly has hue greener or bluer than 5Y unless it is mottled. It is dominantly silt loam to sandy loam, but some pedons have subhorizons of clay loam about 4 inches thick.

Beltsville Series

The soils of the Beltsville series are fine-loamy, mixed, mesic Typic Fragiudults. They are very deep and moderately well drained and have a slowly permeable layer. They formed in Coastal Plain sediments on uplands. Slopes range from 0 to 8 percent.

Typical pedon of Beltsville silt loam, 3 to 8 percent slopes, about 4 miles south of Beltsville, about 50 feet north of Fairland Road, and 500 feet west of the Prince Georges County line:

A—0 to 2 inches; very dark gray (10YR 3/1) silt loam; moderate fine granular structure; very friable; many fine roots; strongly acid; abrupt wavy boundary.

E—2 to 13 inches; olive yellow (2.5Y 6/6) silt loam; weak fine subangular blocky structure; friable; many fine and medium roots; strongly acid; gradual smooth boundary.

Bt1—13 to 21 inches; brownish yellow (10YR 6/6) silty clay loam; few medium faint brown (7.5YR 5/8) mottles; moderate medium and coarse subangular blocky structure; firm; common fine and medium roots; common faint clay films on faces of peds; about 5 percent gravel; strongly acid; clear wavy boundary.

Bt2—21 to 31 inches; brownish yellow (10YR 6/8) silty clay loam; few fine distinct red (2.5YR 5/6) mottles; weak thick platy structure; firm; few fine roots along faces of peds; few faint clay films on faces of peds; strongly acid; clear irregular boundary.

Btx—31 to 42 inches; reddish yellow (7.5YR 6/6) silty clay loam; many fine faint reddish yellow (5YR 6/8) mottles; many vertical and horizontal gray streaks between faces of peds; moderate very coarse prismatic structure parting to moderate very thick platy; very firm; brittle; few fine roots along faces of peds; few faint clay films on faces of peds; strongly acid; clear smooth boundary.

BC—42 to 48 inches; reddish yellow (7.5YR 6/6) clay loam; many medium distinct light yellowish brown (10YR 6/4) and reddish yellow (7.5YR 6/8) and prominent white (2.5Y 8/2) mottles; moderate very coarse prismatic structure parting to moderate coarse angular and subangular blocky; very firm; brittle; about 5 percent gravel; strongly acid; clear wavy boundary.

2C—48 to 60 inches; very pale brown (10YR 7/3) clay loam; many medium distinct reddish yellow (7.5YR 6/6) and light gray (10YR 7/2) mottles; massive; very firm; about 10 percent gravel; strongly acid.

The thickness of the solum ranges from 40 to 64 inches. Depth to the fragipan ranges from 12 to 34 inches. The content of rock fragments ranges from 0 to 5 percent in the solum and from 10 to 20 percent in the 2C horizon. Reaction ranges from strongly acid to extremely acid in unlimed areas.

The A horizon has hue of 2.5Y or 10YR, value of 2 to 7, and chroma of 1 to 6.

The BE and Bt horizons have hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 8. They are silt loam or silty clay loam. The Bx horizon commonly is variegated and may have low-chroma mottles. It is silt loam, silty clay loam, loam, or clay loam in the fine-earth fraction.

The 2C horizon has hue of 2.5Y or 10YR, value of 4 to 7, and chroma of 2 to 4 or is variegated with many colors. It is stratified sandy loam to clay loam in the fine-earth fraction.

Blocktown Series

The soils of the Blocktown series are loamy-skeletal, mixed, mesic, shallow Typic Hapludults. They are shallow and well drained. They formed in material weathered from phyllite and schist. They are on uplands on the Piedmont Plateau. Slopes range from 0 to 45 percent.

Typical pedon of Blocktown channery silt loam, in an area of Brinklow-Blocktown channery silt loams, 3 to 8 percent slopes, about 1 mile south of Woodfield, 1,510 feet north on Log House Road from its intersection with Watkins Road, and 2,265 feet east:

Ap—0 to 6 inches; yellowish red (5YR 4/6) channery silt loam; moderate medium granular structure; friable; many fine roots; about 30 percent channers; slightly acid; abrupt smooth boundary.

Bt—6 to 17 inches; red (2.5YR 4/6) extremely channery silt loam; weak medium granular structure; friable; few fine roots; about 60 percent channers; many prominent clay films on faces of peds; slightly acid; abrupt wavy boundary.

Cr—17 to 21 inches; variegated red (2.5YR 4/6) and yellowish red (5YR 5/6), soft bedrock that crushes to extremely channery silt loam; inherited rock structure; firm; about 90 percent channers; strongly acid; clear wavy boundary.

R—21 inches; hard phyllite bedrock.

Depth to the Cr horizon ranges from 10 to 20 inches. The depth to hard bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 15 to 50 percent in the A horizon and from 35 to 90 percent in the B and C horizons. The fine-earth fraction of the textural control section is more than 50 percent silt and very fine sand. In unlimed areas reaction ranges from moderately acid to slightly acid.

The A horizon has hue of 7.5YR to 2.5YR, value of 3 to 5, and chroma of 4 to 6. It is silt loam or loam in the fine-earth fraction.

The B horizon has hue of 7.5YR to 10R, value of 3 to 5, and chroma of 3 to 8. It is silt loam, loam, or silty clay loam in the fine-earth fraction.

The C horizon has hue of 7.5YR to 2.5YR, value of 3 to 5, and chroma of 4 to 8. It is silt loam or loam in the fine-earth fraction.

Bowmansville Series

The soils of the Bowmansville series are fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents. They are very deep and are somewhat poorly drained or poorly drained. They formed in mixed alluvium on flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Bowmansville silt loam, in an area of Bowmansville-Melvin silt loams, 0 to 2 percent slopes, occasionally flooded, about 2,600 feet west on River Road from its intersection with Willard Road and 200 feet south:

Ap—0 to 11 inches; reddish brown (5YR 4/3) silt loam; weak medium granular structure; friable; strongly acid; abrupt smooth boundary.

B—11 to 15 inches; reddish brown (5YR 5/4) silt loam; common fine distinct pinkish gray (7.5YR 6/2) and reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

Bg1—15 to 24 inches; pinkish gray (7.5YR 6/2) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

Bg2—24 to 34 inches; pinkish gray (7.5YR 6/2) silt loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

Cg1—34 to 48 inches; pinkish gray (7.5YR 6/2) silt loam; common fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

Cg2—48 to 62 inches; pinkish gray (7.5YR 6/2) sandy loam; common medium strong brown (7.5YR 5/6) mottles; massive; strongly acid.

The depth to bedrock ranges from 6 to 10 feet. The content of rock fragments ranges from 0 to 15 percent in the solum, from 0 to 30 percent in the part of the C horizon within a depth of 40 inches, and from 10 to 90 percent below that depth. Reaction ranges from strongly acid to slightly acid in the solum and from strongly acid to neutral in the C horizon.

The A or Ap horizon has hue of 5YR or 7.5YR, value of 4, and chroma of 2 to 4. It is sandy loam, loam, or silt loam in the fine-earth fraction.

The B horizon is neutral in hue or has hue of 5YR or 7.5YR. It has value of 3 to 6 and generally has chroma of 0 to 2. Some subhorzons have higher chroma. This horizon is sandy loam, loam, silt loam, silty clay loam, or sandy clay loam in the fine-earth fraction.

The C horizon is neutral in hue or has hue of 5YR to 10YR. It has value of 3 to 6 and chroma of 0 to 2. It is sandy loam, loam, silt loam, or silty clay loam in the fine-earth fraction.

Brentsville Series

The soils of the Brentsville Series are coarse-loamy, mixed, mesic Typic Hapludults. They are moderately deep and well drained. They formed in material weathered from Triassic sandstone. They are on uplands. Slopes range from 0 to 15 percent.

Typical pedon of Brentsville sandy loam, 3 to 8 percent slopes, about 2 miles southeast of Dickerson, about 300 feet northwest of the intersection of Martinsburg Road and Wasche Road:

Ap—0 to 10 inches; reddish brown (5YR 4/4) sandy loam; weak fine subangular blocky structure parting to weak fine granular; friable; many fine roots; about 5 percent channers; strongly acid; abrupt smooth boundary.

Bt1—10 to 21 inches; yellowish red (5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; few fine roots; many fine interstitial pores; common prominent clay films on faces of peds and lining pores; about 10 percent channers; strongly acid; clear wavy boundary.

Bt2—21 to 33 inches; reddish brown (2.5YR 4/4) sandy loam; weak medium subangular blocky structure; friable; few fine roots; many fine interstitial pores; common prominent clay films on faces of peds and lining pores; about 10 percent channers; strongly acid; abrupt wavy boundary.

R—33 inches; fractured Triassic sandstone bedrock.

The depth to bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 2 to 35 percent in the B horizon and from 25 to 35 percent in the C horizon. Reaction ranges from extremely acid to strongly acid in unlimed areas.

The A horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 3 to 6. The B horizon has hue of 5YR to 10R, value of 3 to 5, and chroma of 3 to 6. It is sandy loam or loam in the fine-earth fraction. The C horizon, if it occurs, has colors and textures similar to those of the B horizon.

Brinklow Series

The soils of the Brinklow series are fine-loamy, mixed, mesic Ochreptic Hapludults. They are moderately deep and well drained. They formed in material weathered from acid crystalline rocks. They are on broad ridgetops and side slopes in the uplands on the Piedmont Plateau. Slopes range from 3 to 25 percent.

Typical pedon of Brinklow channery silt loam, in an area of Brinklow-Blocktown channery silt loams, 3 to 8 percent slopes, 2 miles northwest of Laytonsville, about 1.5 miles west on Rocky Road from its intersection with State Route 108, and 600 feet north:

Ap—0 to 10 inches; brown (7.5YR 5/4) channery silt loam; weak fine granular structure; friable; common fine roots; about 15 percent channers; slightly acid; abrupt smooth boundary.

Bt—10 to 19 inches; strong brown (7.5YR 5/8) channery silt loam; moderate medium subangular blocky structure; friable; few fine roots; about 20 percent channers; common fine tubular pores; many prominent clay films on faces of peds and lining pores; moderately acid; clear wavy boundary.

BC—19 to 25 inches; variegated strong brown (7.5YR 5/8), reddish yellow (7.5YR 7/6), and yellowish red (5YR 5/6) channery loam; moderate medium and fine subangular blocky structure; friable; about 30 percent channers; common fine tubular pores; moderately acid; abrupt wavy boundary.

Cr—25 to 35 inches; reddish yellow (5YR 7/6), soft bedrock that crushes to very channery loam; platy rock structure; firm; about 40 percent channers; moderately acid; abrupt wavy boundary.

R—35 inches; hard phyllite bedrock.

The thickness of the solum and the depth to paralithic contact range from 20 to 40 inches. The depth to hard bedrock ranges from 30 to 60 inches. The content of veined quartz and phyllite fragments ranges from 5 to 35 percent in the A and B horizons and from 35 to 50 percent in the C horizon. Reaction ranges from very strongly acid to moderately acid in unlimed areas.

The A horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 2 to 6.

The B horizon has hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. It is loam, silt loam, or silty clay loam in the fine-earth fraction.

The C horizon has hue of 7.5YR to 10R, value of 4 to 7, and chroma of 4 to 8. It is loam or silt loam in the fine-earth fraction. The Cr horizon is dense in place but is well weathered phyllite that can be penetrated by hand tools.

Bucks Series

The soils of the Bucks series are fine-loamy, mixed, mesic Typic Hapludults. They are deep and well drained. They formed in material weathered from shale, fine grained siltstone, or other siltstone. They are on broad ridgetops. Slopes range from 0 to 15 percent.

Typical pedon of Bucks silt loam, 3 to 8 percent slopes, about 3 miles east of Poolesville, about 150 feet west of the intersection of State Routes 28 and 117:

Ap—0 to 12 inches; dark reddish brown (5YR 4/2) silt loam; weak medium and fine granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.
BE—12 to 17 inches; reddish brown (5YR 5/4) silt loam; moderate medium subangular blocky structure; friable; many fine roots; strongly acid; clear wavy boundary.
Bt1—17 to 23 inches; reddish brown (5YR 5/3) silt loam; moderate medium subangular blocky structure; friable; common fine roots; common fine tubular pores; many prominent clay films on faces of peds and lining pores; very strongly acid; clear wavy boundary.
Bt2—23 to 33 inches; reddish brown (2.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; about 5 percent channers; common fine tubular pores; many prominent clay films on faces of peds and lining pores; very strongly acid; clear wavy boundary.
C—33 to 45 inches; reddish brown (2.5YR 4/4) channery silt loam; massive; firm in place; about 30 percent channers; strongly acid; abrupt wavy boundary.
R—45 inches; dusky red (2.5YR 3/2), fractured shale bedrock.

The depth to bedrock ranges from 40 to 60 inches. The content of rock fragments ranges from 0 to 5 percent in the A horizon and in the upper part of the B horizon, from 5 to 30 percent in the lower part of the B horizon, and from 10 to 50 percent in the 2C horizon. Reaction is strongly acid or very strongly in unlimed areas.

The A horizon has hue of 10YR to 5YR, value of 4 or 5, and chroma of 2 to 4. The B and C horizons have hue of 7.5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. They are silt loam, loam, or silty clay loam in the fine-earth fraction.

Chillum Series

The soils of the Chillum series are fine-silty, mixed, mesic Typic Hapludults. They are very deep and well drained. They formed in a silty mantle over unconsolidated Coastal Plain sediments. They are on uplands. Slopes range from 0 to 25 percent.

Typical pedon of Chillum silt loam, 3 to 8 percent slopes, about 4 miles northeast of White Oak, 1,000 feet east on Broadbirch Drive from its intersection with Tech Road, 125 feet south of the roadway:

Ap—0 to 7 inches; grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable; many very fine, fine, and medium roots; very strongly acid; abrupt smooth boundary.
E—7 to 13 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; many very fine and fine and common medium roots; very strongly acid; clear wavy boundary.
Bt1—13 to 19 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine and medium and few coarse roots; common prominent clay films on faces of peds; very strongly acid; gradual wavy boundary.
Bt2—19 to 28 inches; yellowish brown (10YR 5/6) silt loam; strong fine and medium angular blocky structure; friable; few fine, medium, and coarse roots; many prominent clay films on faces of peds; about 1 percent gravel; strongly acid; gradual smooth boundary.
2C—28 to 60 inches; strong brown (7.5YR 5/6) very gravelly sandy loam; massive; friable; about 45 percent gravel; strongly acid.

The thickness of the solum ranges from 20 to 36 inches. The content of gravel is 0 to 1 percent in the solum and 10 to 80 percent in the 2C horizon. Reaction is strongly acid to extremely acid in unlimed areas.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. It is silt loam or loam in the fine-earth fraction.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 to 5. It is silt loam or loam in the fine-earth fraction.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is silt loam or silty clay loam in the fine-earth fraction.

The 2C horizon has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 6. It is sandy loam or loam in the fine-earth fraction.

Chrome Series

The soils of the Chrome series are fine, mixed, mesic Typic Hapludalfs. They are moderately deep and well drained. They formed in material weathered from serpentine. They are on broad uplands. Slopes range from 3 to 15 percent.

Typical pedon of Chrome silt loam, in an area of Chrome and Conowingo soils, 3 to 8 percent slopes, about 2 miles west of Rockville, 1,000 feet south on Piney Meetinghouse Road from its intersection with Boswell Lane, and 2,200 feet west:

Oi—1 inch to 0; decomposed and partially decomposed leaf and twig litter.

A—0 to 10 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; many fine and medium and common coarse roots; common very fine interstitial pores; about 10 percent gravel; moderately acid; clear smooth boundary.

Bt1—10 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm, sticky and plastic; common fine and medium and few coarse roots; few fine tubular pores; many prominent clay films on faces of peds and lining pores; about 5 percent gravel; neutral; clear wavy boundary.

Bt2—16 to 23 inches; brown (10YR 4/3) and yellowish brown (10YR 5/6) gravelly silty clay loam; strong medium and coarse subangular blocky structure; firm, very sticky and very plastic; few fine and medium roots; few fine tubular pores; many prominent clay films on faces of peds and lining pores; about 20 percent gravel; neutral; abrupt wavy boundary.

R—23 inches; hard, fractured serpentine bedrock.

The depth to bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 0 to 30 percent in the B horizon and from 10 to 80 percent in the C horizon. Reaction ranges from moderately acid to neutral.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4. The B horizon and the C horizon, if it occurs, have hue of 10YR or 7.5YR and value and chroma of 3 or 4. They are silty clay loam or clay loam in the fine-earth fraction.

Codorus Series

The soils of the Codorus series are fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts. They are very deep and are moderately well drained or somewhat poorly drained. They formed in recently deposited alluvium derived mainly from metamorphic and crystalline rocks. They are on smooth flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Codorus silt loam, 0 to 3 percent slopes, occasionally flooded, about 1 mile east of Hyattstown, in an area of brush on the east side of Prescott Road, about 200 feet north of its intersection with Hyattstown Mill Road:

Ap—0 to 11 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Bw1—11 to 18 inches; brown (10YR 5/3) silt loam; weak fine and medium subangular blocky structure; friable; many fine roots; few fine tubular pores; moderately acid; clear wavy boundary.

Bw2—18 to 40 inches; yellowish brown (10YR 5/4) gravelly silt loam; common medium faint light brownish gray (10YR 6/2) and common fine faint yellowish brown (10YR 5/8) mottles; weak medium and fine subangular blocky structure; friable; many fine roots; common fine tubular pores; about 15 percent gravel; moderately acid; clear wavy boundary.

2C—40 to 60 inches; yellowish brown (10YR 5/6) very gravelly silt loam; common fine faint light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; massive; friable; about 40 percent gravel; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to sandy and gravelly material is more than 40 inches. The depth to bedrock is more than 6 feet. The content of water-rounded gravel ranges from 0 to 15 percent in the solum, from 0 to 25 percent in the part of the C horizon within a depth of 40 inches, and from 0 to 70 percent below that depth. In unlimed areas reaction ranges from very strongly acid to moderately acid in the upper part of the solum and from strongly acid to slightly acid in the lower part of the solum and in the C horizon.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 2 or 3. It is loam or silt loam in the fine-earth fraction.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Mottles with chroma of 2 or less are within a depth of 24 inches. This horizon is loam, silt loam, or silty clay loam in the fine-earth fraction.

The C horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 6. It is loam, silt loam, or silty clay loam in the fine-earth fraction.

Conowingo Series

The soils of the Conowingo series are fine-loamy, mixed, mesic Aquic Hapludalfs. They are deep or very deep and are moderately well drained or somewhat poorly drained. They formed in material weathered from basic rocks high in content of magnesium, generally serpentine. They are on slightly concave uplands. Slopes range from 0 to 15 percent.

Typical pedon of Conowingo silt loam, 0 to 3 percent slopes, about 2 miles west of Rockville on the west side of (Piney) Meetinghouse Road, 0.75 mile south of the junction of (Piney) Meetinghouse Road and Travilah Road:

Ap—0 to 9 inches; light olive brown (2.5Y 5/4) silt loam; moderate fine and medium granular structure;

friable, sticky and slightly plastic; many roots; strongly acid; clear smooth boundary.

Bt1—9 to 17 inches; yellowish brown (10YR 5/4) silty clay loam; strong medium angular and subangular blocky structure; hard, firm, sticky and plastic; common roots; few faint clay films on faces of peds; black (10YR 2/1) manganese stains; about 10 percent gravel; strongly acid; clear wavy boundary.

Bt2—17 to 27 inches; yellowish brown (10YR 5/4) gravelly silty clay loam; common medium distinct olive gray (5Y 5/2), light olive brown (2.5Y 5/6), and strong brown (7.5YR 5/6) mottles; moderate medium angular and subangular blocky structure; firm, sticky and plastic; few roots; many prominent clay films on faces of peds; few black (10YR 2/1) manganese stains; about 15 percent gravel; strongly acid; clear wavy boundary.

BCg—27 to 32 inches; olive gray (5Y 5/2) gravelly silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium and coarse angular blocky structure; firm, sticky and plastic; about 15 percent gravel; strongly acid; gradual wavy boundary.

C1—32 to 46 inches; strong brown (7.5YR 5/8) gravelly silt loam; inherent rock structure; friable, slightly sticky and slightly plastic; many fragments of weathered serpentine; few black (10YR 2/1) manganese stains; about 20 percent gravel; moderately acid; gradual wavy boundary.

C2—46 to 60 inches; variegated strong brown (7.5YR 5/8), light yellowish brown (2.5YR 6/4), and brownish yellow (10YR 6/6) very gravelly silt loam; inherent rock structure; about 40 percent gravel and cobbles; slightly acid.

The depth to bedrock ranges from 42 to 72 inches. The content of rock fragments ranges from 0 to 20 percent in the B horizon and from 10 to 50 percent in the C horizon. The content of stones ranges from 0 to 10 percent in the C horizon. In unlimed areas reaction is strongly acid to mildly alkaline.

The Ap horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 3 or 4.

The Bt horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 3 to 6. In some pedons it has high-chroma mottles in the upper part, and in some it has high- and low-chroma mottles in the lower part. This horizon is silty clay loam or clay loam in the fine-earth fraction.

The BC horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It has low- or high-chroma mottles, or both. It is silt loam or silty clay loam in the fine-earth fraction.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8 and in some pedons is mottled. It is silt loam, silty clay loam, or clay loam in the fine-earth fraction.

Croom Series

The soils of the Croom series are loamy-skeletal, mixed, mesic Typic Hapludults. They are very deep and well drained. They formed in fluvial deposits of gravel, sand, and clay. They are on uplands. Slopes range from 0 to 40 percent.

Typical pedon of Croom gravelly loam, 3 to 8 percent slopes, in a wooded area 2 miles south of Burtonsville, about 1,200 feet west of the Prince Georges County line on Greencastle Road, and 200 feet northeast:

Ap—0 to 8 inches; brown (10YR 4/3) gravelly loam; weak fine granular structure; very friable; many fine and medium roots; about 20 percent gravel; strongly acid; abrupt smooth boundary.

E—8 to 14 inches; light yellowish brown (10YR 6/4) gravelly loam; weak fine and medium subangular blocky structure; friable; common fine and medium roots; about 15 percent gravel; strongly acid; clear wavy boundary.

Bt1—14 to 21 inches; yellowish brown (10YR 5/6) very gravelly loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common fine pores; few faint clay films on faces of peds and lining pores; about 50 percent gravel; moderately acid; clear wavy boundary.

Bt2—21 to 28 inches; strong brown (7.5YR 5/6) very gravelly sandy loam; weak fine subangular blocky structure; firm; few fine roots; common fine pores; few faint clay films on faces of peds and lining pores; about 55 percent gravel; moderately acid; clear wavy boundary.

BC—28 to 42 inches; reddish yellow (7.5YR 6/6) very gravelly sandy loam; massive; very friable; few faint clay films bridging sand grains; about 55 percent gravel; strongly acid; gradual wavy boundary.

C—42 to 65 inches; reddish yellow (7.5YR 6/6) very gravelly loamy sand; single grain; loose; about 55 percent gravel; strongly acid.

The thickness of the solum ranges from 40 to 120 inches. The content of gravel ranges from 50 to 70 percent in the upper part of the B horizon and from 50 to 90 percent in the lower part of the B horizon and in the C horizon. In unlimed areas reaction ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 to 4.

The B horizon has hue of 10YR to 5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, sandy clay loam, or loam in the fine-earth fraction.

The C horizon has hue of 10YR to 5YR, value of 4 to 6, and chroma of 2 to 6. It is sand, loamy sand, or sandy loam in the fine-earth fraction.

Croton Series

The soils of the Croton series are fine-silty, mixed, mesic Typic Fragiaqualfs. They are deep and poorly drained and have a fragipan. They formed in silty colluvium and residuum underlain mainly by sandstone. They are in colluvial depressions on uplands. Slopes range from 0 to 3 percent.

Typical pedon of Croton silt loam, 0 to 3 percent slopes, about 1 mile northeast of Poolesville, in a pasture about 1,000 feet north of Dry Seneca Creek on Cattail Road, and 100 feet northwest:

A1—0 to 5 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; common medium faint grayish brown (10YR 5/2) mottles; moderate fine and medium granular structure; friable, slightly sticky and slightly plastic; many very fine and fine roots; strongly acid; clear wavy boundary.

A2—5 to 12 inches; brown (10YR 4/3) silt loam; many medium faint pale brown (10YR 6/3) mottles; moderate fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine and fine roots; strongly acid; clear wavy boundary.

Btg—12 to 17 inches; pinkish gray (5YR 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to weak medium platy; firm, slightly sticky and plastic; brittle; few fine roots; many prominent clay films on faces of peds; about 5 percent channers; strongly acid; clear wavy boundary.

Btxg—17 to 32 inches; pinkish gray (5YR 6/2) silty clay loam; many medium prominent strong brown (7.5YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium platy; firm, sticky and plastic; brittle; few fine roots along faces of peds; many prominent clay films on faces of peds; very strongly acid; abrupt wavy boundary.

C1—32 to 48 inches; reddish brown (5YR 4/3) silt loam; common medium distinct yellowish red (5YR 5/8) mottles; massive; firm in place, slightly sticky and slightly plastic; about 10 percent channers; very strongly acid; abrupt wavy boundary.

C2—48 to 56 inches; dark reddish gray (5YR 4/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; massive; friable, sticky and plastic; about 10 percent channers; very strongly acid; abrupt wavy boundary.

R—56 inches; fine grained Triassic sandstone bedrock.

Depth to the fragipan ranges from 15 to 25 inches and the depth to bedrock from 42 to 60 inches. The C horizon has 10 to 35 percent pebbles. In unlimed areas reaction is strongly acid or very strongly acid in the A horizon and moderately acid to very strongly acid in the B and C horizons.

The A horizon has hue of 10YR to 5YR, value of 3 or 4, and chroma of 2 to 4.

The B horizon has hue of 10YR to 5YR, value of 5 or 6, and chroma of 1 to 6. The faces of peds have a dominant chroma of 2 or less. This horizon is silt loam or silty clay loam in the fine-earth fraction. The Bx horizon is firm or very firm and is brittle. It has medium or coarse prismatic structure.

The C horizon has hue of 10YR to 5YR, value of 3 or 4, and chroma of 2 or 3. It has mottles with value of 5 or 6 and chroma of 2 to 8. It is silt loam, silty clay loam, or the channery analogs of those textures.

Delanco Series

The soils of the Delanco series are fine-loamy, mixed, mesic Aquic Hapludults. They are very deep and are moderately well drained or somewhat poorly drained. They formed in alluvium derived from crystalline rocks. They are on stream terraces. Slopes range from 0 to 3 percent.

Typical pedon of Delanco silt loam, 0 to 3 percent slopes, occasionally flooded, about 3 miles west of Poolesville, 1.75 miles west on Whites Ferry Road from its intersection with Martinsburg Road, 200 feet north of the roadway:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; common very fine and fine roots; slightly acid; clear smooth boundary.

Bt1—8 to 19 inches; dark yellowish brown (10YR 4/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—19 to 27 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct strong brown (7.5YR 5/8) and common fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; slightly firm; few fine roots; common faint clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt3—27 to 38 inches; yellowish brown (10YR 5/6) silty clay loam; many medium distinct strong brown (7.5YR 5/8) and few medium distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; slightly firm; few faint clay films on faces of peds; very strongly acid; clear smooth boundary.

C—38 to 48 inches; strong brown (7.5YR 4/6) silt loam; many coarse distinct strong brown (7.5YR 5/8) mottles; massive; friable; about 5 percent pebbles; very strongly acid; gradual smooth boundary.

2C—48 to 60 inches; red (2.5YR 4/6) sandy loam; common fine distinct strong brown (7.5YR 5/8) mottles; massive; friable; about 5 percent gravel; very strongly acid.

The depth to low-chroma mottles ranges from 15 to 30 inches. The depth to bedrock is more than 5 feet. The content of waterworn pebbles ranges from 0 to 5 percent in the solum and from 5 to 25 percent in the C horizon. Reaction ranges from strongly acid to extremely acid in unlimed areas.

The A horizon has hue of 10YR to 2.5YR, value of 3 to 5, and chroma of 1 to 4.

The Bt horizon has hue of 10YR or 7.5YR and value of 4 to 7. It generally has chroma of 6 to 8, but in some pedons it has chroma of 1 to 4 in the lower part. This horizon is mottled in the middle and lower parts. It is silt loam, clay loam, silty clay loam, or loam in the fine-earth fraction.

The C horizon has hue of 2.5YR to 10YR, value of 4 to 6, chroma of 1 to 6 and is mottled. It is sandy loam to silt loam in the fine-earth fraction.

Elioak Series

The soils of the Elioak series are clayey, kaolinitic, mesic Typic Hapludults. They are very deep and well drained. They formed in material weathered from micaceous schist and gneiss. They are on uplands. Slopes range from 3 to 15 percent.

Typical pedon of Elioak silt loam, 3 to 8 percent slopes, about 2 miles north of Rockville, 50 feet east of the intersection of Chieftan Avenue and Derwood Road:

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; many fine roots; moderately acid; abrupt smooth boundary.

E—6 to 10 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium granular structure; very friable; common fine roots; strongly acid; gradual smooth boundary.

BE—10 to 15 inches; yellowish red (5YR 5/6) silt loam; weak fine subangular blocky structure; friable; few fine roots; strongly acid; gradual smooth boundary.

Bt1—15 to 33 inches; red (2.5YR 4/6) silty clay loam; moderate fine subangular blocky structure; friable, sticky and slightly plastic; few fine roots; many prominent clay films on faces of peds; common fine mica flakes; strongly acid; gradual wavy boundary.

Bt2—33 to 42 inches; variegated red (2.5YR 5/6), yellowish red (5YR 5/6), and strong brown (7.5YR 5/6) silty clay loam; weak medium platy structure; friable, slightly sticky and slightly plastic; few fine roots; many prominent clay films on faces of peds; common fine mica flakes; strongly acid; gradual wavy boundary.

C—42 to 60 inches; variegated yellowish red (5YR 4/6), weak red (10R 6/8), and reddish yellow (7.5YR 6/8) silt loam; fine and distinct variegations, the cut faces of which appear brindled; very friable; many fine mica flakes; strongly acid.

The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 0 to 20 percent in the B and C horizons. Reaction ranges from moderately acid to very strongly acid in unlimed areas.

The A and E horizons have hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 4.

The B horizon generally has hue of 10R to 5YR, value of 3 to 5, and chroma of 4 to 8, but some subhorizons are variegated. This horizon is silt loam, silty clay loam, or clay loam to silty clay in the fine-earth fraction.

The C horizon is commonly variegated in shades of yellow or red. In some pedons it is uniform in color, having hue of 2.5YR to 7.5YR and value and chroma of 4 to 6. This horizon is loam, silt loam, or fine sandy loam in the fine-earth fraction.

Elk Series

The soils of the Elk series are fine-silty, mixed, mesic Ultic Hapludalfs. They are very deep and well drained. They formed in mixed alluvium derived from siltstone and sandstone. They are on stream terraces. Slopes range from 0 to 3 percent.

Typical pedon of Elk silt loam, 0 to 3 percent slopes, occasionally flooded, about 2.5 miles south of Whites Ferry, 2.5 miles south on River Road from its intersection with Whites Ferry Road, 100 feet south on a farm road and 250 feet west:

Ap—0 to 9 inches; strong (7.5YR 5/4) silt loam; moderate medium and fine subangular blocky structure; friable, slightly sticky and slightly plastic; many very fine and fine roots; about 5 percent cobbles; neutral; abrupt smooth boundary.

Bw—9 to 17 inches; strong brown (7.5YR 5/6) silt loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few faint silt films on faces of peds; neutral; gradual wavy boundary.

Bt1—17 to 29 inches; strong brown (7.5YR 5/6) silty clay loam; strong medium angular blocky structure; firm, sticky and plastic; few fine roots; many prominent clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt2—29 to 42 inches; strong brown (7.5YR 5/6) silty clay loam; strong fine and very fine angular blocky structure; firm, sticky and plastic; few fine roots; many prominent clay films on faces of peds; moderately acid; gradual wavy boundary.

BC—42 to 54 inches; strong brown (7.5YR 5/6) silt loam; moderate medium and fine subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; about 5 percent gravel; moderately acid; clear wavy boundary.

C—54 to 66 inches; strong brown (7.5YR 5/6) silt loam; massive; friable, slightly sticky and slightly plastic; about 10 percent gravel; strongly acid.

The depth to bedrock is more than 5 feet. In unlimed areas reaction is slightly acid to very strongly acid in the A and B horizons and slightly acid to strongly acid in the C horizon.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. In some pedons it has few or common mottles, which are in shades of brown in the upper part and in shades of brown or gray in the lower part. This horizon is silt loam or silty clay loam in the fine-earth fraction.

The C horizon has the same colors as the B horizon. It has 0 to 35 percent gravel. The fine-earth fraction is dominantly silt loam or silty clay loam, but some pedons have strata of fine sandy loam, loam, clay loam, or silty clay.

Elsinboro Series

The soils of Elsinboro series are fine-loamy, mixed, mesic Typic Hapludults. They are very deep and well drained. They formed in alluvium derived from crystalline rocks. They are on stream terraces. Slopes range from 0 to 8 percent.

Typical pedon of Elsinboro silt loam, 0 to 3 percent slopes, about 2 miles north of Ashland, about 1 mile on Haviland Mill Road from its intersection with New Hampshire Avenue to a sharp right turn, then 50 feet north:

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; common very fine roots; moderately acid; clear smooth boundary.

Bt—9 to 28 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common very fine and fine roots; common prominent clay films on faces of peds; moderately acid; clear smooth boundary.

BC—28 to 37 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few very fine roots; about 5 percent gravel; strongly acid; clear smooth boundary.

C1—37 to 54 inches; strong brown (7.5YR 5/6) silt loam; massive; friable; about 5 percent gravel; strongly acid; gradual smooth boundary.

C2—54 to 60 inches; strong brown (7.5YR 5/6) silt loam; common fine faint strong brown (7.5YR 4/6) mottles; massive; friable; about 5 percent gravel; strongly acid.

The depth to bedrock is more than 6 feet. Reaction is strongly acid or very strongly acid in unlimed areas.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. Some pedons have an E horizon, which has the same colors as the A horizon.

The B horizon commonly becomes redder with increasing depth. It has hue of 7.5YR or 10YR in the upper part and hue of 7.5YR to 2.5YR in the lower part. This horizon has value of 4 or 5 and chroma of 4 to 8. It is loam, silt loam, clay loam, or silty clay loam in the fine-earth fraction.

The C horizon has hue of 7.5YR to 2.5YR, value of 4 to 6, and chroma of 4 to 8. It can be stratified or variegated. It is sandy loam, fine sandy loam, loam, or silt loam in the fine-earth fraction. The content of gravel and cobbles is as much as 25 percent.

Evesboro Series

The soils of the Evesboro series are mesic, coated Typic Quartzipsamments. They are very deep and excessively drained. They formed in sandy marine material on uplands. Slopes range from 8 to 25 percent.

Typical pedon of Evesboro loamy sand, 3 to 15 percent slopes, about 2 miles east of Burtonsville; from State Route 198, about 3,000 feet north on Riding Stable Road and 50 feet east:

Ap—0 to 11 inches; dark yellowish brown (10YR 4/4) loamy sand; weak fine granular structure; very friable; common very fine and fine roots; about 5 percent gravel; slightly acid; abrupt smooth boundary.

Bw1—11 to 24 inches; brownish yellow (10YR 6/6) loamy sand; single grain; loose; few fine roots; few faint clay films bridging sand grains; about 5 percent gravel; slightly acid; gradual smooth boundary.

Bw2—24 to 40 inches; brownish yellow (10YR 6/6) fine sand; single grain; loose; common faint clay films bridging sand grains; strongly acid; gradual irregular boundary.

C—40 to 60 inches; yellow (10YR 7/8) fine sand; common fine faint strong brown (7.5YR 5/8) mottles; single grain; loose; strongly acid.

The depth to bedrock is more than 6 feet. The content of rounded quartzose gravel ranges from 0 to 25 percent. It commonly is highest in the C horizon. Reaction ranges from strongly acid to extremely acid in unlimed areas. The fine-earth fraction is coarse sand to fine sand or loamy sand throughout the profile.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The B horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 8. The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 6.

Gaila Series

The soils of the Gaila series are fine-loamy, mixed, mesic Ochreptic Hapludults. They are very deep and well drained. They formed in material weathered from quartz muscovite schist. They are on uplands. Slopes range from 0 to 15 percent.

Typical pedon of Gaila silt loam, 3 to 8 percent slopes, about 1 mile south of Sandy Spring, about 4,000 feet south from Olney-Sandy Spring Road on Meeting House Road, and 1,000 feet east:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable; common fine roots; common very fine interstitial pores; about 5 percent gravel; neutral; abrupt smooth boundary.

Bt—8 to 17 inches; strong brown (7.5YR 5/8) loam; strong medium subangular blocky structure; friable; few fine roots; common very fine tubular pores; many prominent clay films on faces of peds and lining pores; strongly acid; clear wavy boundary.

BC—17 to 20 inches; yellowish brown (10YR 5/8) loam; weak medium subangular blocky structure; friable; few fine roots; common very fine interstitial pores; few faint clay films lining pores; strongly acid; clear wavy boundary.

C—20 to 76 inches; yellowish brown (10YR 5/4) fine sandy loam; massive; friable; very strongly acid.

The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 0 to 15 percent throughout the profile. Reaction ranges from extremely acid to strongly acid in unlimed areas.

The A horizon has hue of 5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4.

The B horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, loam, or sandy clay loam in the fine-earth fraction.

The C horizon commonly is multicolored in shades of red, yellow, brown, or white. It is sandy loam, loamy sand, or loam in the fine-earth fraction. This horizon has a high content of mica.

Glenelg Series

The soils of the Glenelg series are fine-loamy, mixed, mesic Typic Hapludults. They are very deep and well drained. They formed in material weathered from schist and gneiss. They are on uplands. Slopes range from 0 to 15 percent.

Typical pedon of Glenelg silt loam, 3 to 8 percent slopes, about 3 miles north of Washington Grove, 2,000 feet south of the intersection of State Route 124 and Fieldcrest Road, and 200 feet west:

Ap—0 to 8 inches; brown (7.5YR 4/4) silt loam; moderate medium granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.

Bw—8 to 12 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; many fine roots; few fine interstitial pores; slightly acid; clear wavy boundary.

Bt1—12 to 16 inches; yellowish red (5YR 5/6) silt loam; weak medium subangular blocky structure; friable; common fine roots; common fine interstitial pores; common prominent clay films on faces of peds and lining pores; about 5 percent gravel; slightly acid; clear wavy boundary.

Bt2—16 to 28 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; many fine interstitial pores; common prominent clay films on faces of peds and lining pores; about 5 percent gravel; slightly acid; clear wavy boundary.

C1—28 to 35 inches; yellowish red (5YR 5/8) silt loam; massive; friable; about 10 percent gravel; moderately acid; abrupt smooth boundary.

C2—35 to 60 inches; yellowish red (5YR 5/8) loam; massive; friable; about 5 percent gravel; strongly acid.

The depth to bedrock is more than 6 feet. The content of rock fragments ranges from 0 to 35 percent in the B horizon and from 5 to 35 percent in the C horizon. Many fine mica flakes are in the lower part of the B horizon and in the C horizon. In unlimed areas reaction is very strongly acid to slightly acid.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 1 to 4. It is loam or silt loam in the fine-earth fraction.

The B horizon has hue of 10YR to 5YR, value of 4 or

5, and chroma of 4 to 8. It is loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction.

The C horizon has hue of 10YR to 5YR, value of 4 to 6, and chroma of 2 to 8. It commonly is variegated because of variegations in the saprolite. It is silt loam, loam, or sandy loam in the fine-earth fraction.

Glenville Series

The soils of the Glenville series are fine-loamy, mixed, mesic Aquic Fragiudults. They are very deep, are moderately well drained or somewhat poorly drained, and have a slowly permeable layer. They formed in residuum and colluvium derived from schist, gneiss, and other crystalline rocks. They are along drainageways and in low areas on uplands. Slopes range from 0 to 8 percent.

Typical pedon of Glenville silt loam, 0 to 3 percent slopes, about 2 miles northwest of Brookeville, about 2,040 feet east and 300 feet south of the intersection of Zion Road and Riggs Road:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium subangular blocky structure; friable; many fine and medium roots; about 10 percent gravel; neutral; abrupt smooth boundary.

Bt1—8 to 20 inches; yellowish brown (10YR 5/6) gravelly silt loam; common medium distinct grayish brown (10YR 5/2) mottles in the lower part; moderate medium subangular blocky structure; friable; many medium roots; about 25 percent gravel; neutral; clear wavy boundary.

Bt2—20 to 30 inches; brownish yellow (10YR 5/8) silt loam; common medium faint strong brown (7.5YR 5/8) and common medium distinct grayish brown (2.5YR 5/2) mottles; weak medium angular blocky structure; friable; few fine roots; few faint clay films on faces of peds; about 5 percent gravel; strongly acid; clear wavy boundary.

Btx—30 to 40 inches; yellowish brown (10YR 5/4) loam; grayish brown (10YR 5/2) faces of peds; many medium distinct yellowish red (5YR 5/6) and few medium distinct pale brown (10YR 6/3) mottles; moderate coarse prismatic structure parting to moderate thick platy; firm; brittle; few medium roots on exterior faces of peds; many prominent clay films on faces of peds; very strongly acid; gradual irregular boundary.

C1—40 to 59 inches; variegated strong brown (7.5YR 5/8), light gray (10YR 7/1), and light yellowish brown (2.5YR 6/4) fine sandy loam; massive; friable; about 5 percent gravel; very strongly acid; gradual irregular boundary.

C2—59 to 70 inches; variegated brownish yellow (10YR 6/6), very pale brown (10YR 7/3), and reddish yellow (7.5YR 6/8) sandy loam; massive; very friable; about 10 percent pebbles and cobbles; very strongly acid.

The depth to bedrock is more than 5 feet. Depth to the fragipan ranges from 15 to 30 inches. The content of rock fragments generally increases with increasing depth. It ranges from 0 to 30 percent in the A and B horizons and from 5 to 50 percent in the C horizon. In unlimed areas reaction is neutral to very strongly acid in the A horizon, moderately acid to very strongly acid in the B horizon, and strongly acid or very strongly acid in the C horizon.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 6.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 8. Low-chroma mottles are in the upper 10 inches of the argillic horizon. This horizon is silt loam, clay loam, or silty clay loam in the fine-earth fraction.

The Btx horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is loam or silt loam in the fine-earth fraction. This horizon has moderate medium or thick platy or moderate coarse prismatic structure. It is firm or very firm and is brittle.

The C horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 1 to 8. It is loam, sandy loam, or fine sandy loam in the fine-earth fraction.

Hatboro Series

The soils of the Hatboro series are fine-loamy, mixed, nonacid, mesic Typic Fluvaquents. They are very deep and poorly drained. They formed in alluvium derived from metamorphic and crystalline rocks. They are on flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Hatboro silt loam, 0 to 3 percent slopes, frequently flooded, about 4 miles north of Wheaton, about 3,600 feet east on Bonifant Road from Layhill Road, 150 feet south of the roadway:

A—0 to 11 inches; dark grayish brown (10YR 4/2) silt loam; many medium faint grayish brown (10YR 5/2) and brown (10YR 4/3) and many medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; many fine and medium roots; slightly acid; clear smooth boundary.

Bg1—11 to 18 inches; grayish brown (10YR 5/2) silt loam; many medium faint dark grayish brown (10YR 4/2) and common medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine and medium subangular blocky structure; friable; common fine and medium roots; slightly acid; clear wavy boundary.

Bg2—18 to 29 inches; dark gray (10YR 4/1) silt loam; weak fine and medium subangular blocky structure; friable; few fine roots; moderately acid; clear smooth boundary.

BCg—29 to 44 inches; dark gray (10YR 4/1) silt loam; weak medium subangular blocky structure; slightly firm; few fine roots; moderately acid; gradual smooth boundary.

Cg1—44 to 55 inches; dark gray (10YR 4/1) silty clay loam; common medium distinct brown (10YR 5/3 and yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; about 10 percent gravel; slightly acid; gradual smooth boundary.

Cg2—55 to 60 inches; dark gray (10YR 4/1) fine sandy loam; common large bluish gray (5B 5/1) mottles; massive; friable; few fine roots; slightly acid.

The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 0 to 10 percent in the A and B horizons and from 0 to 40 percent in the C horizon. In unlimed areas reaction ranges from very strongly acid to neutral to a depth of 30 inches and from moderately acid to slightly acid below that depth. The depth to low-chroma mottles is 0 to 10 inches.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The B and C horizons have hue of 10YR to 5Y or are neutral in hue. They have value of 4 to 7 and chroma of 0 to 2. The B horizon is sandy clay loam, clay loam, silty clay loam, or silt loam in the fine-earth fraction. Stratified sand, silt, and clay sediments and gravel are in the lower part of the C horizon.

Huntington Series

The soils of the Huntington series are fine-silty, mixed, mesic Fluventic Hapludolls. They are very deep and well drained. They formed in alluvium on flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Huntington silt loam, 0 to 3 percent slopes, occasionally flooded, about 6 miles west of Poolesville, 0.25 mile north of Whites Ferry, and about 150 feet east of the east bank of the Potomac River:

Ap1—0 to 2 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate medium granular structure; very friable; many roots; many fine interstitial pores; slightly acid; abrupt smooth boundary.

Ap2—2 to 12 inches; dark brown (7.5YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak thick platy structure; friable; many roots; slightly acid; abrupt smooth boundary.

Bw—12 to 65 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; few fine roots; few faint grayish silt coatings; slightly acid.

The thickness of the solum commonly is 40 to 60 inches, but it ranges to 70 inches. The content of rock fragments is 0 to 3 percent in the solum. Reaction ranges from moderately acid to mildly alkaline.

The A horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is silt loam or silty clay loam in the fine-earth fraction.

The C horizon, if it occurs, has colors similar to those of the Bw horizon. It is silty clay loam to fine sand or is the gravelly analogs of the textures within that range. It commonly is stratified.

Hyattstown Series

The soils of the Hyattstown series are loamy-skeletal, mixed, mesic, shallow Typic Hapludalfs. They are shallow and well drained. They formed in material weathered from phyllite. They are on uplands. Slopes range from 3 to 45 percent.

Typical pedon of Hyattstown channery silt loam, in an area of Linganore-Hyattstown channery silt loams, 3 to 8 percent slopes, about 2,500 feet north on Old Hundred Road from its intersection with Comus Road, 2,300 feet west on a farm road and 500 feet north:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) channery silt loam; moderate medium granular structure; friable; many fine roots; about 15 percent channers; neutral; clear wavy boundary.

Bt1—9 to 14 inches; yellowish brown (10YR 5/4) very channery clay loam; moderate medium and fine subangular blocky structure; friable; many fine and few medium roots; common fine pores; many prominent clay films on faces of peds and lining pores; about 45 percent channers; neutral; clear wavy boundary.

Bt2—14 to 18 inches; brown (7.5YR 5/4) extremely channery clay loam; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few faint clay films on faces of peds; about 65 percent channers; neutral; clear wavy boundary.

Cr—18 to 26 inches; variegated brown (7.5YR 5/4 and 10YR 5/3) saprolite bedrock that crumbles to extremely channery clay loam; inherited rock structure; firm in place; about 75 percent channers; neutral; clear irregular boundary.

R—26 inches; hard phyllite bedrock.

The thickness of the solum and the depth to weathered bedrock range from 10 to 20 inches. The depth to hard bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 35 to 75 percent in the B and C horizons. Reaction ranges from moderately acid to neutral.

The A horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 4 to 8. It is silt loam or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 4 to 8. It is silt loam or loam in the fine-earth fraction.

The Cr horizon is dense in place but is well weathered phyllite that can be penetrated by hand tools.

Jackland Series

The soils of the Jackland series are fine, montmorillonitic, mesic Aquic Hapludalfs. They are very deep and are moderately well drained or somewhat poorly drained. They formed in material weathered from diabase. They are on uplands. Slopes range from 0 to 8 percent.

Typical pedon of Jackland silt loam, 3 to 8 percent slopes, about 0.25 mile north of Potomac, 640 feet east on Ronald Drive from its intersection with Falls Road, 100 feet north of the roadway:

Ap—0 to 10 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium and fine subangular blocky structure; friable; many fine and medium roots; about 10 percent gravel; moderately acid; abrupt smooth boundary.

Bt1—10 to 18 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm; many fine and common medium roots; common fine tubular pores; few faint clay films on faces of peds and lining pores; about 5 percent gravel; moderately acid; clear wavy boundary.

Bt2—18 to 32 inches; yellowish brown (10YR 5/4) clay loam; few faint grayish brown (10YR 5/2) mottles; moderate medium platy structure parting to moderate medium and fine angular blocky; firm; few fine roots; common fine tubular pores; common fine and medium ferromagnesium concretions; many prominent clay films on faces of peds and lining pores; many pressure faces and slickensides; moderately acid; clear wavy boundary.

BC—32 to 48 inches; yellowish brown (10YR 5/6 and 10YR 5/4) clay loam; few fine faint grayish brown (10YR 5/2) mottles; moderate medium platy structure parting to moderate medium and fine subangular blocky; friable; common fine ferromagnesium concretions; few faint clay films on faces of peds; slightly acid; clear smooth boundary.

C1—48 to 54 inches; variegated pale yellow (10YR 7/6) and pale brown (10YR 6/3) clay loam; common fine distinct grayish brown (10YR 5/2) mottles; massive; friable; moderately acid; clear smooth boundary.

C2—54 to 69 inches; variegated pale yellow (2.5YR 7/4), yellow (2.5Y 7/6), and pale olive (5Y 6/4) sandy loam; common fine distinct grayish brown (10YR 5/2) mottles; massive; friable; slightly acid.

The depth to bedrock is more than 60 inches. The content of partially weathered diabase pebbles ranges from 0 to 15 percent in the A and B horizons and is as much as 30 percent in the C horizon. A few boulders are in some pedons. In unlimed areas reaction ranges from very strongly acid to moderately acid in the A horizon and in the upper part of the B horizon and from very strongly acid to mildly alkaline in the lower part of the B horizon and in the C horizon.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is clay loam, sandy clay loam, or clay in the fine-earth fraction. The BC horizon has colors and textures similar to those of the Bt horizon.

The C horizon is commonly variegated in shades of brown, yellow, white, green, or black. It is clay loam, sandy clay loam, or sandy loam in the fine-earth fraction.

Legore Series

The soils of the Legore series are fine-loamy, mixed, mesic, Ultic Hapludalfs. They are very deep and well drained. They formed in material weathered from diabase and related rocks. They are on uplands. Slopes range from 3 to 15 percent.

Typical pedon of Legore silt loam, 3 to 8 percent slopes, near Boyds, 1,000 feet south of the intersection of State Route 117 and White Ground Road:

Ap—0 to 8 inches; brown (7.5YR 4/4) silt loam; weak fine granular structure; friable; common fine and very fine roots; about 5 percent gravel; moderately acid; abrupt smooth boundary.

Bt1—8 to 20 inches; yellowish red (5YR 5/6) silty clay loam; common fine and medium subangular blocky structure; firm; few fine and very fine roots; many prominent clay films on faces of peds; about 5 percent gravel; slightly acid; clear wavy boundary.

Bt2—20 to 28 inches; yellowish red (5YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; few very fine roots; many prominent clay films on faces of peds; about 10 percent gravel; moderately acid; clear wavy boundary.

BC—28 to 34 inches; yellowish red (5YR 5/6) gravelly silt loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; about 15 percent gravel; moderately acid; gradual wavy boundary.

C—34 to 60 inches; yellowish red gravelly loam; common lithochromic reddish brown (5YR 5/4) and brownish yellow (10YR 6/8) streaks; massive; friable; about 25 percent gravel; moderately acid.

The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 3 to 35 percent throughout the profile. The rock fragments are mainly pebbles, but some are cobbles or stones. In unlimed areas reaction ranges from strongly acid to slightly acid in the A horizon and from moderately acid to slightly acid in the B and C horizons.

The A horizon has hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 to 4. Value of 3 is confined to the A1 horizon.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 6. It is clay loam or silty clay loam in the fine-earth fraction.

The BC horizon has colors similar to those of the Bt horizon. It is silt loam, sandy loam, or the gravelly analogs of those textures.

The C horizon is variegated but dominantly has hue of 10YR and 7.5YR, value of 3 to 5, and chroma of 4 to 8. It is sandy loam, loam, silt loam, or silty clay loam in the fine-earth fraction.

Lindside Series

The soils of the Lindside series are fine-silty, mixed, mesic Fluvaquentic Eutrochrepts. They are very deep and moderately well drained. They formed in alluvium washed mainly from lime-influenced soils. They are on flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Lindside silt loam, 0 to 3 percent slopes, occasionally flooded, about 5 miles south of Poolesville, 3,300 feet south on Sycamore Landing Road from its intersection with River Road and 50 feet east:

A1—0 to 3 inches; dark brown (10YR 3/3) silt loam; moderate thin platy structure parting to moderate fine granular; friable; many fine and medium and common coarse roots; many fine interstitial pores; slightly acid; abrupt smooth boundary.

A2—3 to 9 inches; brown (10YR 4/3) silt loam; common fine distinct strong brown (10YR 4/6) mottles; moderate fine and medium subangular blocky structure parting to weak fine granular; friable; common fine and few medium and coarse roots; many very fine interstitial pores; slightly acid; clear smooth boundary.

BA—9 to 22 inches; brown (10YR 4/3) silt loam; moderate fine and medium subangular blocky structure; friable; few fine, medium, and coarse roots; many very fine tubular pores; neutral; clear smooth boundary.

Bg—22 to 33 inches; grayish brown (10YR 5/2) silt loam; many fine and medium strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; friable; few fine roots; many very fine tubular pores; neutral; gradual smooth boundary.

Cg1—33 to 54 inches; grayish brown (10YR 5/2) silt loam; many medium distinct strong brown (7.5YR 5/6 and 7.5YR 4/6) mottles; massive; firm; few fine roots; few very fine tubular pores; neutral; gradual wavy boundary.

Cg2—54 to 65 inches; grayish brown (10YR 5/2) clay loam; many large distinct strong brown mottles; massive; firm; neutral.

The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 0 to 5 percent within a depth of 40 inches and is as much as 30 percent below that depth. The depth to low-chroma mottles ranges from 14 to 24 inches. Reaction ranges from strongly acid to mildly alkaline.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3.

The B horizon has hue of 7.5YR to 2.5Y and value of 4 or 5. It has chroma of 3 to 6 within a depth of 20 inches and chroma of 1 to 4 below that depth. This horizon is dominantly silt loam or silty clay loam in the fine-earth fraction, but some pedons have thin strata of very fine sandy loam, fine sandy loam, loam, or clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of dominantly 1 to 4. It can have chroma of 6 or 8, however, where colors are mixed. This horizon is silty clay loam to sandy loam in the fine-earth fraction.

Linganore Series

The soils of the Linganore series are loamy-skeletal, mixed, mesic Ultic Hapludalfs. They are moderately deep and well drained. They formed in material weathered from phyllite and schist. They are on uplands. Slopes range from 3 to 45 percent.

Typical pedon of Linganore channery silt loam, in an area of Linganore-Hyattstown channery silt loams, 3 to 8 percent slopes, about 1 mile southwest of Lewisdale, about 4,200 feet south on Clarksburg Road from its intersection with Lewisdale Road, then 50 feet east:

Ap1—0 to 4 inches; dark grayish brown (10YR 4/2) channery silt loam; moderate medium subangular blocky structure parting to moderate fine and medium granular; friable; many fine roots; about 30 percent channers; neutral; gradual wavy boundary.

Ap2—4 to 11 inches; dark brown (10YR 4/3) very channery silt loam; moderate fine and medium subangular blocky structure; friable; common fine roots; about 35 percent channers; neutral; clear wavy boundary.

Bt—11 to 17 inches; olive brown (2.5Y 4/4) very channery silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common fine tubular pores; many prominent clay films on faces of peds and lining pores; about 40 percent channers; neutral; clear wavy boundary.

BC—17 to 22 inches; olive gray (5Y 4/2) extremely channery silt loam; few faint clay films on faces of peds and lining pores; about 70 percent channers; neutral; clear wavy boundary.

Cr—22 to 51 inches; grayish brown (2.5Y 5/2), soft bedrock that crushes to extremely channery silt loam; inherited thin platy rock structure; firm; about 75 percent rock fragments; slightly acid; abrupt wavy boundary.

R—51 inches; hard phyllite bedrock.

The thickness of the solum and the depth to weathered bedrock range from 20 to 40 inches. The content of rock fragments ranges from 35 to 75 percent in the B and C horizons and includes as much as 15 percent stones. Reaction is neutral to strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4. Value of 3 is confined to the A1 horizon.

The B horizon has hue of 7.5YR to 5Y and value of 4 to 6. It generally has chroma of 4 to 8, but the BC horizon may have chroma as low as 2. The fine-earth fraction is silt loam, silty clay loam, or clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 8. It is silt loam, silty clay loam, or clay loam in the fine-earth fraction.

Melvin Series

The soils of the Melvin series are fine-silty, mixed, nonacid, mesic Typic Fluvaquents. They are very deep and poorly drained. They formed in mixed alluvium on flood plains. Slopes range from 0 to 2 percent.

Typical pedon of Melvin silt loam, 0 to 2 percent slopes, occasionally flooded, about 5 miles south of Poolesville, 3,200 feet south on Sycamore Landing Road from its intersection with River Road, then 1,000 feet west in a wooded area:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; many medium distinct dark yellowish brown (10YR 3/6) mottles; weak medium subangular blocky structure; friable; many very fine and few fine and medium roots; common small concretions of organic matter; moderately acid; abrupt smooth boundary.

Bg—9 to 24 inches; light brownish gray (10YR 6/2) silt loam; many coarse distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/7) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; slightly acid; clear wavy boundary.

Cg1—24 to 46 inches; light gray (10YR 7/2) silty clay loam; many coarse distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) mottles; massive; firm; few fine, medium, and coarse roots; many fine black (10YR 2/1) manganese stains; slightly acid; clear wavy boundary.

Cg2—46 to 60 inches; light gray (10YR 7/2) silt loam; many coarse distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) mottles; massive; few fine and medium roots; about 5 percent gravel; many black (10YR 2/1) manganese stains; slightly acid.

The depth to bedrock is more than 5 feet. The content of rock fragments, mostly pebbles, ranges from 0 to 5 percent in the upper 30 inches and is as much as 20 percent below that depth. Reaction ranges from moderately acid to mildly alkaline.

The A horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 4. The B and C horizons have hue of 10YR, 2.5Y, or 5Y or are neutral in hue. They have value of 4 to 7 and chroma of 0 to 2. They have mottles in shades of brown or red. They are dominantly silt loam or silty clay loam in the fine-earth fraction. Below a depth of 40 inches, however, some pedons have strata of loam, clay, sand, or sand and gravel.

Montalto Series

The soils of the Montalto series are fine, mixed, mesic Ultic Hapludalfs. They are very deep and well drained. They formed in material weathered from basic igneous rocks. They are on uplands. Slopes range from 3 to 25 percent.

Typical pedon of Montalto silt loam, 3 to 8 percent slopes, about 2 miles west of Poolesville, about 200 feet south and 600 feet east of the intersection of Whites Ferry Road and Edwards Ferry Road:

Ap—0 to 12 inches; dark reddish brown (5YR 3/2) silt loam; weak medium subangular blocky structure; friable; many fine and medium roots; common fine interstitial pores; slightly acid; abrupt smooth boundary.

Bw—12 to 15 inches; dark red (2.5YR 3/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; many fine pores; strongly acid; gradual wavy boundary.

Bt1—15 to 23 inches; dark red (10R 3/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; common faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—23 to 42 inches; dark red (10R 3/6) silty clay; strong fine and medium angular blocky structure; firm; many prominent clay films on faces of peds; few fine black manganese coatings; about 10 percent stones; strongly acid; gradual wavy boundary.

BC—42 to 54 inches; red (2.5YR 4/8) silty clay loam variegated with strong brown (7.5YR 5/8); weak medium subangular blocky structure; firm in place, friable when removed; few prominent clay films on faces of peds; few fine black manganese stains; few pockets of material from the Bt2 horizon; about 10 percent stones; strongly acid; gradual wavy boundary.

C—54 to 72 inches; strong brown (7.5YR 5/8) silt loam variegated with yellowish red (5YR 5/6); massive; about 10 percent stones; moderately acid or slightly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 0 to 30 percent throughout the profile. In unlimed areas reaction ranges from very strongly acid to slightly acid. The acidity decreases with increasing depth.

The A horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. Value of 3 is confined to the A1 horizon.

The B horizon has hue of 10R to 5YR, value of 3 or 4, and chroma of 4 to 8. The fine-earth fraction of the BE and Bw horizons is silt loam or silty clay loam. The fine-earth fraction of the Bt horizon is dominantly silty clay or clay, but some pedons have subhorizons of silty clay loam.

The C horizon has a wide range in color and is variegated in many pedons. It is silt loam or silty clay loam in the fine-earth fraction.

Neshaminy Series

The soils of the Neshaminy series are fine-loamy, mixed, mesic Ultic Hapludalfs. They are deep and well drained. They formed in material weathered from diabase and other dark basic rocks. They are on uplands. Slopes range from 3 to 15 percent.

Typical pedon of Neshaminy silt loam, 3 to 8 percent slopes, about 2 miles south of Potomac, 1.5 miles southwest on Old Brickyard Road from its intersection with Falls Road:

Ap—0 to 5 inches; dark brown (7.5YR 4/4) silt loam; weak fine granular structure; friable; many fine roots; about 5 percent gravel; strongly acid; abrupt smooth boundary.

Bw1—5 to 8 inches; yellowish red (5YR 4/6) silt loam; weak coarse subangular blocky structure; friable; few fine roots; about 5 percent gravel; strongly acid; abrupt smooth boundary.

Bw2—8 to 13 inches; yellowish red (5YR 4/8) silty clay loam; moderate fine subangular blocky structure; friable; about 5 percent gravel; strongly acid; abrupt smooth boundary.

Bt1—13 to 23 inches; red (2.5YR 4/8) silty clay loam; strong fine and medium angular blocky structure; friable; few faint clay films; about 5 percent gravel; strongly acid; abrupt smooth boundary.

Bt2—23 to 35 inches; red (2.5YR 4/8) clay loam; strong thick platy structure; friable; few faint clay films; about 10 percent gravel; strongly acid; abrupt smooth boundary.

BC—35 to 48 inches; red (2.5YR 4/8) gravelly silty clay loam; moderate fine angular blocky structure; friable; about 15 percent gravel; moderately acid; abrupt smooth boundary.

Cr—48 to 54 inches; loose, weathered, granitized mica schist bedrock; moderately acid; abrupt wavy boundary.

R—54 inches; hard, granitized mica schist bedrock.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 4 feet. The content of rock fragments ranges from 0 to 40 percent in the B and C horizons. The rock fragments are as much as 20 inches in size. In unlimed areas reaction ranges from very strongly acid to moderately acid in the upper part of the solum and from strongly acid to slightly acid in the lower part of the solum and in the C horizon.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 4.

The B horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8. The fine-earth faction is silty clay loam, clay loam, loam, or sandy loam.

The C horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 4 to 6. In some pedons it is variegated. The fine-earth faction is silt loam, loam, or sandy loam.

Nestoria Series

The soils of the Nestoria series are loamy-skeletal, mixed, mesic, shallow Ultic Hapludalfs. They are shallow and well drained. They formed in material weathered from Triassic siltstone and fine grained sandstone. They are on side slopes in the uplands. Slopes range from 35 to 50 percent.

Typical pedon of Nestoria very gravelly silt loam, in an area of Nestoria-Rock outcrop complex, 25 to 50 percent slopes, about 4 miles south of Poolesville, 0.75 mile west on River Road from its intersection with Willard Road, then 250 feet north:

A—0 to 2 inches; dark reddish brown (5YR 3/3) very gravelly silt loam; strong fine granular structure; very friable; many very fine and fine roots; about 35 percent pebbles and 5 percent cobbles; moderately acid; abrupt smooth boundary.
BE—2 to 6 inches; red (2.5YR 4/6) extremely gravelly silt loam; weak fine subangular blocky structure; very friable; many fine and medium and few coarse roots; about 50 percent pebbles and 10 percent cobbles; moderately acid; clear wavy boundary.
Bt—6 to 13 inches; red (2.5YR 4/6) extremely gravelly silt loam; weak fine subangular blocky structure; very friable; many fine and medium and few coarse roots; about 55 percent pebbles and 10 percent cobbles; common faint clay films on faces of peds; moderately acid; clear wavy boundary.
BC—13 to 18 inches; red (2.5YR 4/6) extremely gravelly silt loam; massive; very friable; many fine, common medium, and few coarse roots; about 55 percent pebbles and 10 percent cobbles; many thin silt films on faces of peds and rock fragments; moderately acid; abrupt wavy boundary.
Cr—18 to 36 inches; soft, highly fractured, weathered siltstone bedrock; abrupt wavy boundary.
R—36 inches; hard siltstone bedrock.

Depth to the Cr horizon ranges from 10 to 20 inches, and the depth to hard bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 35 to 75 percent in the B and C horizons. The fine-earth fraction of the textural control section has more than 50 percent silt and very fine sand. Reaction ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR, 2.5YR, or 5YR and value and chroma of 3 or 4. The Bt horizon has hue of 10YR, 2.5YR, or 5YR, value of 3 or 4, and chroma of 3 to 6. It is silt loam or loam in the fine-earth fraction. The Cr horizon is dense in place but includes well weathered red beds that can be penetrated by hand tools. The bedrock cannot be removed by hand tools.

Occoquan Series

The soils of the Occoquan series are fine-loamy, mixed, mesic Ochreptic Hapludults. They are deep and well drained. They formed in material weathered from gneiss and schist. They are on broad ridgetops and side slopes in the uplands. Slopes range from 3 to 15 percent.

Typical pedon of Occoquan loam, 3 to 8 percent slopes, 0.5 mile north of Redland, about 1,400 feet north of the intersection of Muncaster Mill Road and Shady Grove Road:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) loam; weak thick platy structure; friable; many fine roots; about 10 percent channers; slightly acid; abrupt wavy boundary.
Bt—8 to 15 inches; yellowish brown (10YR 5/6) loam; weak coarse subangular blocky structure; friable; few fine roots; common prominent clay films on faces of peds; about 10 percent channers; slightly acid; clear wavy boundary.
BC—15 to 24 inches; strong brown (7.5YR 5/8) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films lining pores; about 5 percent channers; strongly acid; clear wavy boundary.
C—24 to 59 inches; brownish yellow (10YR 6/8) and strong brown (7.5YR 5/6) fine sandy loam; massive; very friable; about 10 percent channers; strongly acid; abrupt wavy boundary.
Cr—59 inches; fractured, weathered schist bedrock.

The thickness of the solum ranges from 12 to 24 inches. The depth to weathered bedrock ranges from 40 to 60 inches. The depth to hard bedrock is more than 60 inches. The content of rock fragments ranges from 1 to 15 percent throughout the profile. Mica flakes are common in the B and C horizons. Reaction is extremely acid to strongly acid in unlimed areas.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 4. The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It is loam, fine sandy loam, sandy loam, sandy clay loam, or clay loam. The C horizon is multicolored in shades of red, yellow, brown, or white. It is loam, sandy loam, or loamy sand.

Penn Series

The soils of the Penn series are fine-loamy, mixed, mesic Ultic Hapludalfs. They are moderately deep and well drained. They formed in material weathered from Triassic siltstone, sandstone, and shale. They are on uplands. Slopes range from 0 to 45 percent.

Typical pedon of Penn silt loam, 8 to 15 percent slopes, about one-eighth mile north of Dawsonville, 1,650 feet north on State Route 28 from its intersection with White Grounds Road, and 330 feet east:

Ap—0 to 9 inches; reddish brown (2.5YR 4/4) silt loam; weak medium and fine subangular blocky structure; friable; many fine and medium roots; about 5 percent channers; slightly acid; abrupt wavy boundary.

Bt—9 to 16 inches; dark red (2.5YR 3/6) silt loam; moderate medium and fine angular blocky structure; friable; many fine pores; many prominent clay films on faces of peds and lining pores; many fine and medium roots; about 10 percent channers; strongly acid; clear wavy boundary.

BC—16 to 21 inches; reddish brown (2.5YR 4/4) channery silt loam; moderate medium and fine subangular blocky structure; friable; few fine tubular pores; few faint clay films on faces of peds; few fine roots; about 20 percent channers; strongly acid; abrupt wavy boundary.

C—21 to 36 inches; weak red (2.5YR 4/2) extremely channery silt loam; massive; firm; about 60 percent channers consisting of weatherable, soft bedrock that easily crushes to silt loam; strongly acid; clear wavy boundary.

Cr—36 inches; dusky red (10R 3/3), soft siltstone bedrock.

The thickness of the solum ranges from 17 to 34 inches. The depth to bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 5 to 50 percent in individual subhorizons of the B horizon and from 30 to 90 percent in the C horizon. In unlimed areas reaction is extremely acid to strongly acid in the upper part of the solum, strongly acid to moderately acid in the lower part of the solum, and strongly acid to slightly acid in the C horizon.

The A horizon has hue of 7.5YR to 10R, value of 3 or 4, and chroma of 2 to 4. The B horizon has hue of 5YR to 10R, value of 3 to 6, and chroma of 2 to 6. It is silt loam, loam, or silty clay loam in the fine-earth fraction. The C horizon has hue of 5YR to 10R, value of 3 or 4, and chroma of 2 to 4. It is silt loam or sandy loam in the fine-earth fraction.

Readington Series

The soils of the Readington series are fine-loamy, mixed, mesic Typic Fragiudalfs. They are deep and moderately well drained. They formed in material weathered from Triassic siltstone, sandstone, and shale. They are on slightly concave uplands and at the head of drainageways.

Typical pedon of Readington silt loam, 0 to 3 percent slopes, about 4 miles southwest of Poolesville, about 1 mile north on Partnership Road from River Road, and 1,200 feet west:

Oi—2 inches to 0; litter of partially decomposed, mixed hardwood leaves.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; very weak thin platy structure; very friable; many very fine and fine roots; strongly acid; abrupt smooth boundary.

A2—3 to 6 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

BA—6 to 14 inches; brown (7.5YR 4/4) silty clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; weak silt coatings in pores and root channels; very strongly acid; abrupt smooth boundary.

Bt—14 to 20 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; many faint clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btx—20 to 30 inches; yellowish red (5YR 4/6) silty clay loam; many medium prominent light gray (10YR 7/1) and strong brown (7.5YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium platy; firm; brittle; many faint clay films on faces of peds; very strongly acid; abrupt smooth boundary.

BC—30 to 44 inches; red (2.5YR 4/6) channery silt loam; massive; friable; about 30 percent weathered siltstone channers; very strongly acid; abrupt wavy boundary.

R—44 inches; slightly weathered siltstone bedrock.

The thickness of the solum ranges from 35 to 60 inches. The depth to bedrock ranges from 40 to 60 inches. Depth to the fragipan ranges from 20 to 36 inches. The content of rock fragments ranges from 0 to 20 percent in the upper part of the solum and from 5 to 50 percent in the lower part. In unlimed areas reaction ranges from slightly acid to extremely acid.

The A horizon has hue of 2.5YR to 10YR, value of 3 or 4, and chroma of 2 to 4. The Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 3 to 6. The Bx and BC horizons have hue of 10R to 5YR, value of 3 or 4, and chroma of 2 to 6. The fine-earth fraction of the B horizon is loam to silty clay loam.

Rowland Series

The soils of the Rowland series are fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts. They are very deep and are moderately well drained or somewhat poorly drained. They formed in alluvial sediments derived from red siltstone and sandstone and from conglomerate. They are on flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Rowland silt loam, 0 to 3 percent slopes, occasionally flooded, about 5 miles south of Poolesville, 200 feet south on Sycamore Landing Road from River Road and 75 feet east:

Ap—0 to 11 inches; dark brown (7.5YR 4/4) silt loam; moderate fine granular structure; friable; many fine and very fine roots; common very fine interstitial pores; slightly acid; abrupt wavy boundary.

Bw1—11 to 14 inches; brown (7.5YR 5/4) silt loam; common fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few fine roots; few very fine interstitial pores; moderately acid; clear wavy boundary.

Bw2—14 to 34 inches; light brown (7.5YR 6/4) silt loam; many coarse distinct strong brown (7.5YR 5/8) and common fine distinct brown (7.5YR 5/2) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine tubular and interstitial pores; strongly acid; gradual smooth boundary.

C—34 to 54 inches; brown (7.5YR 5/4) and light brown (7.5YR 6/4) silt loam; many coarse distinct strong brown (7.5YR 5/8) and common fine distinct brownish gray (10YR 6/2) mottles; massive; friable; about 30 percent gravel; moderately acid; clear wavy boundary.

2C—54 to 66 inches; brown (7.5YR 5/4) and light brown (7.5YR 6/4), stratified silt loam and gravelly loamy sand; many coarse distinct strong brown (7.5YR 5/8) and common fine distinct brownish gray (10YR 6/2) mottles; massive; friable; about 30 percent gravel; moderately acid.

The thickness of the solum ranges from 24 to 40 inches. The depth to stratified sand and gravel is more than 40 inches. The content of gravel ranges from 0 to 10 percent in the solum, from 0 to 25 percent in the C horizon, and from 30 to 90 percent in the 2C horizon. Reaction is very strongly to moderately acid throughout the profile in unlimed areas.

The A horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 6.

The B horizon has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 3 to 8. Distinct high- and low-chroma mottles are within 24 inches of the surface. This horizon is silt loam, loam, silty clay loam, or sandy clay loam.

The C horizon has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 2 to 8. It is sandy loam to silty clay loam in the fine-earth fraction. The 2C horizon is dominantly stratified sand and gravel but in some pedons has lenses of silt or clay.

Sassafras Series

The soils of the Sassafras series are fine-loamy, siliceous, mesic Typic Hapludults. They are very deep and well drained. They formed in sandy marine and old alluvial sediments on the Coastal Plain. Slopes range from 3 to 15 percent.

Typical pedon of Sassafras loam, 3 to 8 percent slopes, in a wooded area 2 miles south of Burtonsville, about 1,000 feet north on U.S. Route 29 from its intersection with Briggs Chaney Road, 100 feet west of the roadway:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable; many fine and medium roots; moderately acid; clear wavy boundary.

BE—8 to 13 inches; dark yellowish brown (10YR 4/6) loam; weak fine subangular blocky structure; friable; many fine and medium roots; moderately acid; clear wavy boundary.

Bt1—13 to 17 inches; yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) sandy clay loam; moderate fine and medium subangular blocky structure; friable; common fine and medium roots; many fine pores; many prominent clay films on faces of peds and lining pores; strongly acid; clear wavy boundary.

Bt2—17 to 22 inches; yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) sandy loam; moderate medium subangular blocky structure; friable; few fine roots; many fine pores; about 5 percent gravel; common prominent clay films on faces of peds and lining pores; strongly acid; clear wavy boundary.

BC—22 to 35 inches; strong brown (7.5YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; about 10 percent gravel; few faint clay films bridging sand grains; moderately acid; gradual smooth boundary.

C—35 to 65 inches; brownish yellow (10YR 6/8) loamy sand; massive; very friable; about 5 percent gravel; moderately acid.

The thickness of the solum ranges from 25 to 45 inches. The content of gravel ranges from 0 to 15 percent in the solum and is as much as 30 percent in the C horizon. In unlimed areas reaction ranges from strongly acid to extremely acid.

The Ap or A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 1 to 4. The lowest value and chroma are confined to an A horizon that is no more than 4 inches thick.

The BE horizon, if it occurs, has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy loam, or sandy clay loam.

The Bt horizon has hue of 10YR to 5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy loam, or sandy clay loam.

The C horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 8. In a few pedons it is variegated. It is sandy loam to sand in the fine-earth fraction. The transition to sandy material is more than 5 inches.

Travilah Series

The soils of the Travilah series are fine-silty, mixed, mesic Aquic Hapludalfs. They are moderately deep and somewhat poorly drained. They formed in material that weathered from serpentine. They are on uplands. Slopes range from 3 to 8 percent.

Typical pedon of Travilah silt loam, 3 to 8 percent slopes, in Hunting Hill, about 2,500 feet south on Travilah Road from its intersection with State Route 28, 110 feet west of the roadway:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; about 5 percent channers; slightly acid; abrupt smooth boundary.

E—5 to 10 inches; light yellowish brown (2.5YR 6/4) silt loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; about 5 percent channers; slightly acid; clear wavy boundary.

Bt1—10 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; common fine tubular pores; about 10 percent channers; many prominent clay films on faces of peds and lining pores; slightly acid; clear wavy boundary.

Bt2—15 to 24 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; many fine ferromagnesium concretions; common fine tubular pores; about 10 percent channers; many prominent clay films on faces of peds and lining pores; slightly acid; clear wavy boundary.

BC—24 to 33 inches; yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) channery silty clay loam; moderate medium angular blocky structure parting to moderate medium and fine subangular blocky; friable, sticky and plastic; many fine ferromagnesium concretions; about 15 percent channers; slightly acid; abrupt wavy boundary.

R—33 inches; hard serpentine bedrock.

The thickness of the solum ranges from 21 to 39 inches. The depth to bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 0 to 30 percent in the B and C horizons. Reaction ranges from moderately acid to mildly alkaline in the B and C horizons.

The Ap horizon has hue of 2.5Y to 7.5YR, value of 4 or 5, and chroma of 2 to 4. Some pedons have a thin A1 horizon, which has value of 2 or 3 and chroma of 0 to 2.

The E horizon, if it occurs, has hue of 2.5Y to 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is silt loam or loam in the fine-earth fraction.

The B horizon generally has hue of 10YR or 7.5YR, but in some pedons it has hue of 2.5Y in the lower part. This horizon has value of 4 or 5 and chroma of 3 to 6. It is silt loam or silty clay loam in the fine-earth fraction.

The C horizon, if it occurs, is commonly multicolored in shades of brown, yellow, green, or black. It is silty clay loam, silt loam, or loam in the fine-earth fraction.

Watchung Series

The soils of the Watchung series are fine, mixed, mesic Typic Ochraqualfs. They are very deep and poorly drained. They formed in material weathered from diabase and other basic rocks. They are on flats and in depressions on uplands. Slopes range from 0 to 3 percent.

Typical pedon of Watchung silty clay loam, 0 to 3 percent slopes, about 1 mile south of Boyds, 1,500 feet south on White Ground Road from its intersection with Hoyles Mill Road, 800 feet northwest along a stream and 40 feet west of the stream:

A—0 to 9 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; many fine and common medium and coarse roots; strongly acid; clear wavy boundary.

Btg1—9 to 15 inches; olive gray (5Y 5/2) clay; common fine faint olive (5Y 5/3) mottles; strong medium and coarse angular blocky structure; firm, sticky and plastic; common fine and medium and few coarse roots; few faint clay films on faces of peds; slightly acid; clear wavy boundary.

Btg2—15 to 22 inches; greenish gray (5GY 5/1) and olive gray (5Y 5/2) clay; common fine faint olive (5Y 5/3) mottles; strong medium and coarse angular blocky structure; firm, very sticky and very plastic; few fine, medium, and coarse roots; common fine tubular pores; many prominent clay films on faces of peds and lining pores; neutral; clear wavy boundary.

Btg3—22 to 33 inches; gray (5Y 6/1) silty clay loam; moderate medium and fine angular blocky structure; firm, sticky and plastic; few fine roots; common prominent clay films on faces of peds; moderately alkaline; clear wavy boundary.

Cg1—33 to 45 inches; olive (5Y 5/3) and greenish gray (5GY 6/1) silty clay loam; massive; friable, slightly sticky and slightly plastic; few fine roots; few faint clay films in the upper part; neutral; clear wavy boundary.

Cg2—45 to 54 inches; greenish gray (5GY 6/1) loam; few fine prominent light olive brown (2.5Y 5/4) mottles; massive; friable, slightly sticky and slightly plastic; neutral; clear wavy boundary.

C—54 to 65 inches; olive (5Y 5/3) and olive gray (5Y 5/2) clay loam; common fine distinct light olive brown (2.5Y 5/4) mottles; massive; firm, slightly sticky and slightly plastic; neutral.

Depth to the lower boundary of the argillic horizon is less than 40 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 15 percent throughout the profile. Reaction ranges from very strongly acid to neutral in unlimed areas.

The A horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 4.

The B horizon has hue of 7.5YR to 5G or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It has common or many, fine to coarse, distinct or prominent mottles. It is dominantly clay or silty clay, but some pedons have subhorizons of silty clay loam.

The C horizon has hue of 7.5YR to 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 6. It is silt loam, loam, clay loam, or silty clay loam.

Wheaton Series

The soils of the Wheaton Series are fine-loamy, mixed, acid, mesic Typic Udorthents. They are very deep and well drained. They formed in material weathered from schist and gneiss. They are in areas that have been altered by heavy equipment. Slopes range from 0 to 15 percent.

Typical pedon of Wheaton silt loam, 0 to 8 percent slopes, about 1 mile west of Wheaton, 0.25 mile east on Veirs Mill Road from its intersection with Aspen Hill Road, then 2,000 feet south on the entrance road to Parklawn Cemetery and 750 feet west of the road:

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable; many fine roots; about 10 percent gravel; strongly acid; abrupt wavy boundary.

C1—6 to 13 inches; strong brown (7.5YR 5/6) loam; massive; friable; common fine roots; few fine pores; about 10 percent gravel; strongly acid; clear wavy boundary.

C2—13 to 20 inches; brown (7.5YR 4/4) loam; massive; friable; about 10 percent gravel; very strongly acid; gradual wavy boundary.

C3—20 to 38 inches; strong brown (7.5YR 5/8) loam; massive; friable; about 10 percent gravel; very strongly acid; gradual wavy boundary.

C4—38 to 68 inches; yellowish red (5YR 5/8) loam; massive; friable; about 10 percent gravel; very strongly acid.

The thickness of the A horizon ranges from 2 to 10 inches. The depth to bedrock is more than 5 feet. The content of rock fragments ranges from 2 to 15 percent throughout the profile. The fine-earth fraction has more than 50 percent silt and very fine sand. Reaction ranges from moderately acid to very strongly acid in unlimed areas.

The A horizon has hue of 10YR to 5YR, value of 3 to 5, and chroma of 2 to 6. The C horizon has hue of 10YR to 5YR, value of 4 or 5, and chroma of 4 to 8. It is silt loam, loam, or fine sandy loam.

Formation of the Soils

This section relates the factors and processes of soil formation to the soils in Montgomery County.

Factors of Soil Formation

Soils form through the interaction of five major factors—climate, plant and animal life, parent material, relief, and time. The relative influence of each factor varies from place to place. In some areas one factor dominates in the formation of a soil and determines most of its properties. Local variations among the soils in Montgomery County result from differences in parent material, relief, and time and from the effects of human activities. The soils in urban areas of the county have been significantly influenced by human activities. Bulldozers and other kinds of earthmoving equipment have destroyed some soils and created or highly modified others.

Climate

Montgomery County has a humid, continental climate marked by seasonal temperature changes. The annual precipitation is about 40 inches, and the mean annual air temperature is about 55 degrees F. The distribution of rainfall, which is nearly uniform throughout the year, reaches a maximum in August. During the growing season, which is the period from April through September, the amount of rainfall averages about 22 inches.

Although there are some differences in climate throughout the county, such as somewhat cooler temperatures and a shorter growing season at the higher elevations, the differences have been too minor to be reflected in soil properties. Because of urban heat, the average soil temperatures may be somewhat higher in downtown areas than in other areas.

The generally humid climate has caused strong weathering and leaching in the natural soils. In most areas the soil material has weathered to a considerable depth because of exposure to climatic forces over a long period. The only material that is not deeply and strongly weathered is either highly resistant to weathering or has been exposed to weathering for only a short period. An example is the material on short, steep slopes.

Almost all of the natural soils in the county are acid, and some are strongly acid to extremely acid. Weathering and leaching have resulted in a low natural supply of plant nutrients in most of the natural soils. Some of the younger manmade soils may be high in content of certain nutrients. The content, however, commonly varies from place to place. Because of the leaching of clay from the surface layer and clay formation, the subsoil in most of the natural soils on uplands is clay enriched. Alternating periods of wetting and drying and of freezing and thawing are responsible for a prismatic or blocky structure in the clay-enriched subsoil. The alternating periods of wetting and drying, especially in the presence of organic material, also are responsible for the segregation and translocation of iron in many soils.

More detailed information about the climate is available in the section "General Nature of the County."

Plant and Animal Life

Living organisms, including vegetation, bacteria, fungi, and animals, significantly affect soil formation. Vegetation generally supplies the organic matter that decomposes and gives a dark color to the surface layer. The vegetation also adds nutrients to this layer. Many of the trees and other plants take up plant nutrients from the soil and store them in their roots, stems, and leaves. When these plants, or parts of them, decompose, the elements are returned to the soil and can be used again. Bacteria and fungi are responsible for decomposing the vegetation and returning the nutrients. Many of the organic reactions and processes of the bacteria and fungi release material that affects the soil-forming processes. Earthworms, ants, cicadas, and burrowing animals mix the soils and affect soil structure. They generally make the soils more open and porous.

Human activities also affect soil structure. In some areas the soils are more porous because of tillage and management practices. In other areas, however, foot or vehicular traffic has compacted the soils and made them more dense. Compaction is a problem in many areas where a low volume of soil air and a stagnant soil atmosphere are the main limitations affecting healthy plant growth. Intensive use and disturbance of some soils have caused accelerated erosion, often accompanied by increased deposition on flood plains and in depressions. In other areas management practices have slowed the rate of erosion. Many of the soils in the county have been chemically altered through applications of lime and fertilizer, which improve the suitability of the soils for desired plants. In areas where concrete pavements dissolve slowly, chemical elements are released and are washed onto the surrounding soils, creating a liming effect. In some areas plants and animals not normally evident in the county have been introduced. These will eventually affect soil formation.

In many areas human activities have created new soils for various purposes. In some areas, these soils have been created only to support activities on the surface and little attention has been given to the physical, chemical, and mineralogical properties of the underlying layers. Much remains to be learned about ways to construct suitable soils. In the urban areas of Montgomery County, human activities have become a dominant force because of the extent of the land alterations.

Parent Material

Parent material influences the mineralogical and chemical composition of the soil and to a large extent the rate of soil formation. The soils in Montgomery County formed in material weathered from Piedmont rocks in place; unconsolidated Coastal Plain sediments consisting of sand, silt, clay, and rock fragments deposited over long periods of geologic time and transported by water, wind, gravity, or a combination of these; recent alluvial sediments deposited on flood plains, in depressions, and on low stream terraces; and rock fragments, saprolite, sand, silt, clay, and organic and inorganic objects associated with human activities.

Material weathered from rocks in the Piedmont physiographic province covers almost all of Montgomery County. This residuum was derived from several kinds of metamorphosed Precambrian, Cambrian, and lower Paleozoic crystalline rocks. The eastern two-thirds of the Piedmont consists of a heterogeneous assemblage of rock types called the Wissahickon Group. These range from coarse grained gneiss to mica schist. The gneiss is medium to coarse grained plagioclase muscovite quartz containing pebbles and boulders of a number of rock types. The soils that formed in material weathered in place from these rocks include those of the Gaila, Occoquan, Glenelg, Brinklow, and Blocktown series.

The schist includes muscovite-quartz-plagioclase schist, albite-chlorite, and micaceous quartzite or graywacke. The schist in the eastern part of the county is generally coarser grained than the schist in the western part. The eastern part generally has a thicker overburden than the western part. The soils that formed in material weathered in place from schist include those of the Glenelg, Gaila, Glenville, Occoquan, Brinklow, and Blocktown series in the eastern part of the county and those of the Brinklow, Blocktown, and Glenville series in the northwestern part.

Consolidated sedimentary rocks of Triassic age are in a basin in the western corner of the county. The soils that formed in material weathered from Triassic sandstone, siltstone, and shale include those of Bucks, Penn, Readington, Brentsville, and Croton series.

A small part of the county is underlain by igneous rocks, including diabase, serpentine, and gabbro. Montalto, Legore, Neshaminy, Chrome, Conowingo, Jackland, Travilah, and Watchung soils formed in material weathered from these rocks.

The part of the county on the Coastal Plain consists of silty, loamy, and sandy sediments and stratified sand and gravel. Unconsolidated deposits of Cretaceous sediments consist of gray and yellow sand; red, brown, and gray clay containing iron nodules; and variegated red and yellow sand, clay, and fine gravel interbedded with layers of clay. The soils that formed in these deposits include those of the Croom, Chillum, and Beltsville series.

Part of Montgomery County is made up of soils that have been highly disturbed human activities. These areas generally consist of Piedmont material and Coastal Plain sediments. Wheaton soils formed in manmade, highly disturbed deposits that do not have artifacts.

Recent alluvial sediments consist of material that has eroded from the Piedmont and Coastal Plain and has been deposited along streams. Hatboro and Codorus soils formed in sediments derived from and associated with schist, gneiss, and phyllite bedrock and deposited on flood plains. Huntington, Lindside, Bowmansville, Melvin, Delanco, Elk, and Rowland soils formed in sediments derived from and associated with sandstone, siltstone, and shale bedrock and deposited on flood plains.

Relief

Montgomery County is almost entirely within the Piedmont physiographic province, which spreads out southeast of the Appalachian Mountains. Along the southeastern edge of the county, between Washington, D.C., and Burtonsville, Coastal Plain sediments lap onto the crystalline basement rocks of the Piedmont. The boundary is not a sharp one but an overlap of much younger formations on older ones. The Piedmont area consists of gently rolling and nearly level uplands strongly dissected by streams that have steep valley walls. The Coastal Plain area generally is strongly dissected but includes some smooth, gently sloping interfluves and a few small dunelike deposits of sandy material.

The entire county slopes from the north and west toward the south and east. The highest point in the county is 873 feet above sea level, in an area near Damascus. The lowest point is about 52 feet above sea level, in an area where the Potomac River flows from Montgomery County into the District of Columbia. Most of the county is 300 to 600 feet above sea level.

Relief affects soil formation through its effects on surface drainage, the percolation of water through the soil, the plant and animal life on and in the soil, and some of the soil-forming processes. Baile and other poorly drained soils in depressions are usually wet. The Glenelg and Gaila soils in the higher convex areas are better drained than the Baile soils and have well developed horizons. The soils on the steeper slopes, such as Blocktown soils, are well drained and generally have weakly expressed horizons because of erosion.

Natural differences in elevation and in shape of the land surface account for many of the differences among soils that formed in the same kind of parent material. Because of the differences in topography, free water leaves the well drained soils and accumulates in the poorly drained soils.

Time

The length of time that the parent material has been in place and exposed to the active forces of climate and of plant and animal life strongly influences the nature of the soil. Very young soils, such as those that formed in recent alluvium or in recently deposited manmade material, are classified as Entisols. The C horizon in these soils extends almost to the surface and is subdivided only on the basis of depositional stratification in the material.

Lindside and Melvin soils on the flood plain along the Potomac River have developed soil structure in the subsoil. The iron in these soils has been segregated into mottles. As a result, the drainage class of the soils can be inferred from the soil color patterns. These soils and most of the other soils that formed in recent alluvium are classified as Inceptisols or Entisols.

The natural soils in the Piedmont and Coastal Plain uplands of Montgomery County normally are much older than the alluvial soils and have profile features reflecting this age. In most of the older soils, the soil-forming processes have resulted in a clay-enriched B horizon. These soils generally are classified as Ultisols.

Morphology of the Soils

The results of the soil-forming factors are evidenced by the different layers, or horizons, in a soil profile. The soil profile extends from the surface down to material that is little altered by the soil-forming processes.

Most soils have three major horizons—the A, B, and C horizons. Some soils, particularly those in forested areas, also have an O (organic) horizon at the surface. This horizon is an accumulation of organic material, such as twigs and leaves, or of humified organic material mixed with a little mineral material. Numbers or lowercase letters indicate subdivisions of the major horizons. The Bt horizon, for example, is the best developed part of a B horizon that has accumulated clay from the overlying horizons. Glenelg soils have a Bt horizon.

The A horizon is a mineral surface layer. It is darkened by humified organic matter. In cultivated areas it is called the Ap horizon, or plow layer. The A horizon is characterized by the maximum leaching, or eluviation, of clay and iron. An E horizon occurs if considerable leaching has taken place and organic matter has not darkened the material. This horizon is normally lighter colored than any other horizon in the profile.

The B horizon, or subsoil, normally underlies the A horizon. It is characterized by the maximum accumulation, or illuviation, of clay, iron, aluminum, or other compounds leached from the surface layer.

In some soils, such as Gaila soils, the B horizon formed mainly through alteration of the original material by accumulation or illuviation. The alteration can result from weathering of the parent material; the release of iron, which results in rusty colors; and the development of soil structure in place of the structure of the original rock or sediments. The B horizon commonly has blocky or prismatic structure. It generally is firmer and lighter in color than the A horizon and is darker than the C and E horizons.

The C horizon is below the A or B horizon. It consists of material that is little altered by the soil-forming processes, but it may be modified by weathering.

In areas of young soils, such as those that formed in recent alluvium or in manmade fill material, the C horizon may reach to or nearly to the surface. The soils in these areas do not have a B horizon and in places do not even have an A horizon.

Processes of Soil Formation

Several processes are involved in the formation of soil horizons. Among these are the accumulation of organic matter, the leaching of soluble constituents, the chemical reduction and transfer of iron, the formation of soil structure, and the formation and translocation of clay minerals. These processes often occur simultaneously in the soils. They have been going on for thousands of years in old soils.

The accumulation and incorporation of organic matter takes place as plant residue and human-deposited organic material decompose and are mixed into the soil. These additions darken the mineral soil material and are responsible for the formation of the A horizon.

In order for a soil to have a distinct subsoil, lime and other soluble material must be leached before the translocation of clay minerals. Once the leaching has taken place, the clay can disperse more easily and can be moved as part of the percolating water. In the soils classified as Ultisols, clay accumulates in the Bt horizon through leaching from the overlying horizons. The leaching stops in the B horizon as a result of flocculation and the drying up of the percolating water. Clay from dissolved silica and aluminum also accumulates in the B horizon. The more inert material, such as silt and sand-sized quartz, concentrates in the A horizon as the more soluble material and the clay are leached out.

A fragipan, or Bx horizon, has formed in the subsoil of some of the moderately well drained soils in the county. The fragipan is very firm and brittle when moist and is very hard when dry. The soil particles are tightly packed, so that the bulk density is high and the pore space is low. Studies indicate that a fragipan forms when shrinking and swelling take place during alternating wet and dry periods. The shrinking and swelling and the material filling the cracks account for the packing of soil particles and for a gross polygonal pattern of cracks in the fragipan. Beltsville and Glenville are examples of soils in Montgomery County that have a fragipan.

The natural, well drained soils in the county have a yellowish brown or reddish brown subsoil. The color comes from finely divided iron oxide minerals that coat the sand, silt, and clay particles. These iron oxides formed from iron released during the weathering of silicate minerals in the present soils or in soils that were the source of the sediments in which the present soils formed. In the more poorly drained soils, gray colors in the subsoil indicate the absence of free iron oxide coatings. In the gray zones the iron was chemically reduced to a more soluble form during wet periods when oxygen was excluded and the iron either was leached from the soils or was concentrated in iron oxide mottles and concretions.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

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 60-inch profile or to a limiting layer is expressed as:

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

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, 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.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

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.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

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

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

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

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

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

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

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

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 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 establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

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

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congeliturbate. Soil material disturbed by frost action.

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

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

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

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

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

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

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

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.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

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

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

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

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

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

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, or clay.

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

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

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

Foot slope. The inclined surface at the base of a hill.

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

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

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

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

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

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

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

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

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

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

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 soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

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

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

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

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

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

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

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

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

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

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

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

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

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

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

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

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

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

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

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

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

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

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

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

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

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

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

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

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.

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

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

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

Percolation. The 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

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

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.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

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

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0

Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 drawbar horsepower rating.

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 ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

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

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

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

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

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

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

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

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

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

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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.

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

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

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

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

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

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

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

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

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

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

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

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

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

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

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

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

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

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

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 that is too thin for the specified use.

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, in soils in extremely small amounts. They are essential to plant growth.

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

Urban land. An area where more than 75 percent of the surface is covered by asphalt, concrete, buildings, or other structures.

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

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-84 at Rockville, Maryland)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	42.6	23.8	33.2	67	1	58	2.81	1.14	4.13	6	5.2
February----	45.9	24.8	35.4	71	3	73	2.65	1.03	3.80	6	3.9
March-------	55.8	32.6	44.2	82	13	191	3.53	2.12	4.67	7	3.6
April-------	67.7	41.9	54.8	89	24	444	3.19	1.82	4.36	8	.1
May---------	76.5	51.3	63.9	91	33	741	3.79	1.90	5.39	8	.0
June--------	83.6	59.4	71.5	96	44	945	3.92	1.67	5.77	6	.0
July--------	87.4	64.0	75.7	98	50	1,107	3.77	1.72	5.26	6	.0
August------	85.7	62.6	74.2	96	47	1,060	4.34	1.65	6.52	6	.0
September---	79.7	55.8	67.8	95	36	834	3.12	.92	4.66	5	.0
October-----	69.3	44.8	57.1	86	25	530	2.91	1.34	4.13	5	.0
November----	57.1	35.7	46.4	78	16	210	2.96	1.24	4.36	6	1.0
December----	46.4	27.2	36.8	69	6	90	2.89	1.30	4.12	6	3.5
Yearly:											
Average---	66.5	43.7	55.1	---	---	---	---	---	---	---	---
Extreme---	---	---	---	99	1	---	---	---	---	---	---
Total-----	---	---	---	---	---	6,283	39.88	31.83	48.54	75	17.3

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-84 at Rockville, Maryland)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 11	Apr. 26	May 11
2 years in 10 later than--	Apr. 5	Apr. 19	May 5
5 years in 10 later than--	Mar. 24	Apr. 5	Apr. 22
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 22	Oct. 11	Sept. 27
2 years in 10 earlier than--	Oct. 31	Oct. 19	Oct. 5
5 years in 10 earlier than--	Nov. 16	Nov. 2	Oct. 20

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-84 at Rockville, Maryland)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	199	177	143
8 years in 10	212	189	156
5 years in 10	236	211	180
2 years in 10	260	233	204
1 year in 10	272	244	217

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1B	Gaila silt loam , 3 to 8 percent slopes	9,474	2.9
1C	Gaila silt loam, 8 to 15 percent slopes	17,180	5.3
2A	Glenelg silt loam, 0 to 3 percent slopes	261	0.1
2B	Glenelg silt loam, 3 to 8 percent slopes	52,024	16.1
2C	Glenelg silt loam, 8 to 15 percent slopes	12,732	3.9
2UB	Glenelg-Urban land complex, 0 to 8 percent slopes	10,232	3.2
2UC	Glenelg-Urban land complex, 8 to 15 percent slopes	7,445	2.3
4B	Elioak silt loam, 3 to 8 percent slopes	1,470	0.5
4C	Elioak silt loam, 8 to 15 percent slopes	134	*
5A	Glenville silt loam, 0 to 3 percent slopes	1,653	0.5
5B	Glenville silt loam, 3 to 8 percent slopes	3,906	1.2
6A	Baile silt loam, 0 to 3 percent slopes	9,255	2.9
7UB	Gaila-Urban land complex, 0 to 8 percent slopes	608	0.2
7UC	Gaila-Urban land complex, 8 to 15 percent slopes	594	0.2
9B	Linganore-Hyattstown channery silt loams, 3 to 8 percent slopes	3,709	1.1
9C	Linganore-Hyattstown channery silt loams, 8 to 15 percent slopes	4,097	1.3
16B	Brinklow-Blocktown channery silt loams, 3 to 8 percent slopes	12,405	3.8
16C	Brinklow-Blocktown channery silt loams, 8 to 15 percent slopes	16,904	5.2
16D	Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	17,030	5.3
17B	Occoquan loam, 3 to 8 percent slopes	12,010	3.7
17C	Occoquan loam, 8 to 15 percent slopes	5,638	1.7
18C	Penn silt loam, 8 to 15 percent slopes, very stony	173	0.1
18E	Penn silt loam, 15 to 45 percent slopes, very stony	91	*
19A	Bucks silt loam, 0 to 3 percent slopes	312	0.1
19B	Bucks silt loam, 3 to 8 percent slopes	1,863	0.6
20A	Brentsville sandy loam, 0 to 3 percent slopes	346	0.1
20B	Brentsville sandy loam, 3 to 8 percent slopes	4,016	1.2
20C	Brentsville sandy loam, 8 to 15 percent slopes	1,339	0.4
21A	Penn silt loam, 0 to 3 percent slopes	457	0.1
21B	Penn silt loam, 3 to 8 percent slopes	12,279	3.8
21C	Penn silt loam, 8 to 15 percent slopes	4,671	1.4
21D	Penn silt loam, 15 to 25 percent slopes	1,689	0.5
21E	Penn silt loam, 25 to 45 percent slopes	699	0.2
21F	Nestoria-Rock outcrop complex, 25 to 50 percent slopes	243	0.1
22A	Readington silt loam, 0 to 3 percent slopes	2,127	0.7
22B	Readington silt loam, 3 to 8 percent slopes	2,864	0.9
23A	Croton silt loam, 0 to 3 percent slopes	1,879	0.6
24C	Montalto silt loam, 8 to 15 percent slopes, very stony	441	0.1
24D	Montalto silt loam, 15 to 25 percent slopes, very stony	149	*
25B	Legore silt loam, 3 to 8 percent slopes	426	0.1
25C	Legore silt loam, 8 to 15 percent slopes	609	0.2
26B	Montalto silt loam, 3 to 8 percent slopes	147	*
26C	Montalto silt loam, 8 to 15 percent slopes	40	*
27B	Neshaminy silt loam, 3 to 8 percent slopes	1,778	0.5
27C	Neshaminy silt loam, 8 to 15 percent slopes	223	0.1
28A	Watchung silty clay loam, 0 to 3 pecent slopes	838	0.3
29B	Jackland silt loam, 3 to 8 percent slopes	1,085	0.3
35B	Chrome and Conowingo soils, 3 to 8 percent slopes	2,084	0.6
35C	Chrome silt loam, 8 to 15 percent slopes	239	0.1
36A	Conowingo silt loam, 0 to 3 percent slopes	77	*
37B	Travilah silt loam, 3 to 8 percent slopes	972	0.3
41A	Elsinboro silt loam, 0 to 3 percent slopes	47	*
41B	Elsinboro silt loam, 3 to 8 percent slopes	430	0.1
43A	Elk silt loam, 0 to 3 percent slopes, occasionally flooded	571	0.2
45A	Delanco silt loam, 0 to 3 percent slopes, occasionally flooded	805	0.2
46A	Huntington silt loam, 0 to 3 percent slopes, occasionally flooded	2,138	0.7
47A	Lindside silt loam, 0 to 3 percent slopes, occasionally flooded	2,285	0.7
48A	Melvin silt loam, 0 to 2 percent slopes, occasionally flooded	1,337	0.4
50A	Rowland silt loam, 0 to 3 percent slopes, occasionally flooded	795	0.2
51A	Bowmansville-Melvin silt loams, 0 to 2 percent slopes, occasionally flooded	1,280	0.4
53A	Codorus silt loam, 0 to 3 percent slopes, occasionally flooded	3,621	1.1
54A	Hatboro silt loam, 0 to 3 percent slopes, frequently flooded	10,781	3.3
55C	Evesboro loamy sand, 3 to 15 percent slopes	69	*

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
57B	Chillum silt loam, 3 to 8 percent slopes	1,296	0.4
57C	Chillum silt loam, 8 to 15 percent slopes	628	0.2
57D	Chillum silt loam, 15 to 25 percent slopes	145	*
57UB	Chillum-Urban land complex, 0 to 8 percent slopes	428	0.1
58B	Sassafras loam, 3 to 8 percent slopes	183	0.1
58C	Sassafras loam, 8 to 15 percent slopes	80	*
59A	Beltsville silt loam, 0 to 3 percent slopes	637	0.2
59B	Beltsville silt loam, 3 to 8 percent slopes	600	0.2
61B	Croom gravelly loam, 3 to 8 percent slopes	391	0.1
61C	Croom gravelly loam, 8 to 15 percent slopes	378	0.1
61D	Croom gravelly loam, 15 to 25 percent slopes	146	*
61E	Croom gravelly loam, 25 to 40 percent slopes	216	0.1
61UB	Croom-Urban land complex, 0 to 8 percent slopes	713	0.2
64B	Croom and Bucks soils, 3 to 8 percent slopes	1,259	0.4
64C	Croom and Bucks soils, 8 to 15 percent slopes	472	0.1
65B	Wheaton silt loam, 0 to 8 percent slopes	3,425	1.1
66UB	Wheaton-Urban land complex, 0 to 8 percent slopes	8,054	2.5
66UC	Wheaton-Urban land complex, 8 to 15 percent slopes	2,303	0.7
67UB	Urban land-Wheaton complex, 0 to 8 percent slopes	1,499	0.5
100	Dumps, refuse	317	0.1
109D	Hyattstown channery silt loam, 15 to 25 percent slopes, very rocky	2,747	0.8
109E	Hyattstown channery silt loam, 25 to 45 percent slopes, very rocky	208	0.1
116C	Blocktown channery silt loam, 8 to 15 percent slopes, very rocky	403	0.1
116D	Blocktown channery silt loam, 15 to 25 percent slopes, very rocky	9,480	2.9
116E	Blocktown channery silt loam, 25 to 45 percent slopes, very rocky	6,566	2.0
200	Pits, gravel	326	0.1
201	Pits, quarry	235	0.1
300	Rock outcrop-Blocktown complex	938	0.3
400	Urban land	5,351	1.7
	Water areas more than 40 acres in size	7,000	2.2
	Total	323,500	100.0

* Less than 0.05 percent. The combined extent of the soils assigned an asterisk in the "Percent" column is about 0.5 percent of the survey area.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland)

Map symbol	Soil name
1B	Gaila silt loam , 3 to 8 percent slopes
2A	Glenelg silt loam, 0 to 3 percent slopes
2B	Glenelg silt loam, 3 to 8 percent slopes
4B	Elioak silt loam, 3 to 8 percent slopes
19A	Bucks silt loam, 0 to 3 percent slopes
19B	Bucks silt loam, 3 to 8 percent slopes
20A	Brentsville sandy loam, 0 to 3 percent slopes
20B	Brentsville sandy loam, 3 to 8 percent slopes
21A	Penn silt loam, 0 to 3 percent slopes
21B	Penn silt loam, 3 to 8 percent slopes
25B	Legore silt loam, 3 to 8 percent slopes
26B	Montalto silt loam, 3 to 8 percent slopes
27B	Neshaminy silt loam, 3 to 8 percent slopes
41A	Elsinboro silt loam, 0 to 3 percent slopes
41B	Elsinboro silt loam, 3 to 8 percent slopes
43A	Elk silt loam, 0 to 3 percent slopes, occasionally flooded
45A	Delanco silt loam, 0 to 3 percent slopes, occasionally flooded
46A	Huntington silt loam, 0 to 3 percent slopes, occasionally flooded
47A	Lindside silt loam, 0 to 3 percent slopes, occasionally flooded
50A	Rowland silt loam, 0 to 3 percent slopes, occasionally flooded
57B	Chillum silt loam, 3 to 8 percent slopes
58B	Sassafras loam, 3 to 8 percent slopes

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

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

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Grass-legume hay	Alfalfa hay	Pasture
		Bu	Bu	Bu	Tons	Tons	AUM*
1B-------------- Gaila	IIe	100	---	45	3.0	3.5	8.0
1C-------------- Gaila	IIIe	95	---	40	2.5	3.0	6.6
2A-------------- Glenelg	I	135	---	50	3.5	5.5	10.5
2B-------------- Glenelg	IIe	135	---	50	3.5	5.5	10.5
2C-------------- Glenelg	IIIe	125	---	45	3.5	5.0	9.5
2UB**, 2UC**. Glenelg-Urban land							
4B-------------- Elioak	IIe	135	---	50	3.5	5.5	10.5
4C-------------- Elioak	IIIe	125	---	45	3.5	5.0	9.5
5A-------------- Glenville	IIw	100	---	40	3.0	3.5	6.5
5B-------------- Glenville	IIe	100	---	40	3.0	3.5	6.5
6A-------------- Baile	Vw	---	---	---	2.0	---	4.0
7UB**, 7UC**. Gaila-Urban land							
9B**------------		85	---	33	2.5	3.3	6.9
Linganore------	IIIe						
Hyattstown-----	IIIs						
9C**------------		75	---	31	2.2	2.5	6.3
Linganore------	IVe						
Hyattstown-----	IIIe						
16B**-----------		108	32	36	2.7	3.6	8.3
Brinklow-------	IIe						
Blocktown------	IIIs						
16C**----------- Brinklow-Blocktown	IIIe	98	27	32	2.7	2.7	7.2
16D**----------- Brinklow-Blocktown	IVe	---	---	---	2.2	2.7	6.2

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Grass-legume hay	Alfalfa hay	Pasture
		Bu	Bu	Bu	Tons	Tons	AUM*
17B------------- Occoquan	IIIe	60	15	20	2.0	---	3.0
17C------------- Occoquan	IVe	50	10	15	1.5	---	3.0
18C------------- Penn	VIs	---	---	---	---	---	---
18E------------- Penn	VIIs	---	---	---	---	---	---
19A------------- Bucks	I	135	---	50	3.5	5.5	10.5
19B------------- Bucks	IIe	135	---	50	3.5	5.5	10.5
20A------------- Brentsville	IIs	85	40	50	2.0	---	7.0
20B------------- Brentsville	IIe	85	40	50	2.0	---	7.0
20C------------- Brentsville	IIIe	60	30	45	1.5	---	6.0
21A------------- Penn	IIs	95	---	40	3.0	3.5	6.5
21B------------- Penn	IIe	95	---	40	3.0	3.5	6.5
21C------------- Penn	IIIe	90	---	35	2.5	3.0	5.5
21D------------- Penn	IVe	80	---	30	2.0	3.0	4.5
21E------------- Penn	VIIe	---	---	---	---	---	---
21F**----------- Nestoria------- Rock outcrop.	 VIIe	---	---	---	---	---	---
22A------------- Readington	IIw	105	---	45	3.0	3.5	6.5
22B------------- Readington	IIe	105	---	45	3.0	3.5	6.5
23A------------- Croton	IVw	70	---	---	2.5	---	4.9
24C------------- Montalto	VIs	---	---	---	---	---	4.0
24D------------- Montalto	VIIs	---	---	---	---	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Grass-legume hay	Alfalfa hay	Pasture
		Bu	Bu	Bu	Tons	Tons	AUM*
25B------------- Legore	IIe	95	---	40	3.0	3.5	6.5
25C------------- Legore	IIIe	90	---	35	2.5	3.0	5.5
26B------------- Montalto	IIe	135	---	50	3.5	5.5	5.5
26C------------- Montalto	IIIe	125	---	45	3.5	5.0	5.5
27B------------- Neshaminy	IIe	135	45	50	3.5	5.5	10.5
27C------------- Neshaminy	IIIe	125	35	45	3.5	5.0	9.5
28A------------- Watchung	IVw	---	---	---	2.0	---	4.0
29B------------- Jackland	IIe	65	---	60	---	---	8.0
35B**----------- Chrome--------- Conowingo------	 IIe IIIw	90	---	---	3.0	---	5.8
35C------------- Chrome	IIIe	75	---	35	2.5	3.0	6.0
36A------------- Conowingo	IIIw	95	35	---	3.0	---	4.5
37B------------- Travilah	IIIw	75	---	30	2.5	3.0	6.0
41A------------- Elsinboro	I	130	---	50	3.5	5.0	9.5
41B------------- Elsinboro	IIe	130	---	50	3.5	5.0	9.5
43A------------- Elk	IIw	130	45	45	4.5	---	9.0
45A------------- Delanco	IIw	120	---	45	3.5	4.5	8.5
46A------------- Huntington	I	135	45	50	3.5	5.0	---
47A------------- Lindside	IIw	125	45	40	3.5	4.5	---
48A------------- Melvin	IIIw	80	35	---	3.5	---	7.0
50A------------- Rowland	IIw	130	---	45	3.5	4.5	8.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Grass-legume hay	Alfalfa hay	Pasture
		Bu	Bu	Bu	Tons	Tons	AUM*
51A**----------- Bowmansville- Melvin	IIIw	106	39	---	3.5	---	6.6
53A------------- Codorus	IIw	130	---	45	3.5	4.5	8.1
54A------------- Hatboro	IIIw	115	---	---	3.5	---	6.6
55C------------- Evesboro	VIIs	---	---	---	---	---	---
57B------------- Chillum	IIe	130	45	50	3.5	---	---
57C------------- Chillum	IIIe	120	40	45	3.5	---	---
57D------------- Chillum	VIe	---	---	---	---	---	---
57UB** Chillum-Urban land							
58B------------- Sassafras	IIIe	120	40	45	3.5	---	---
58C------------- Sassafras	IVe	100	---	40	3.0	---	---
59A------------- Beltsville	IIw	95	35	45	3.0	---	5.5
59B------------- Beltsville	IIIe	80	---	40	3.0	---	5.5
61B------------- Croom	IIe	60	30	30	2.5	---	---
61C------------- Croom	IIIe	55	---	25	1.9	---	---
61D------------- Croom	IVe	40	---	18	---	---	---
61E------------- Croom	VIe	---	---	---	---	---	---
61UB**. Croom-Urban land							
64B**----------- Croom and Bucks	IIe	89	---	38	2.9	---	---
64C**----------- Croom and Bucks	IIIe	83	---	33	2.5	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Grass-legume hay	Alfalfa hay	Pasture
		Bu	Bu	Bu	Tons	Tons	AUM*
65B------------- Wheaton	IIe	120	35	40	3.0	4.0	6.5
66UB**, 66UC**. Wheaton-Urban land							
67UB**. Urban land-Wheaton							
100**. Dumps, refuse							
109D------------ Hyattstown	IVe	---	---	---	1.5	2.0	5.5
109E------------ Hyattstown	VIIe	---	---	---	1.0	1.5	4.5
116C------------ Blocktown	IIIe	75	20	25	2.0	2.0	6.5
116D------------ Blocktown	IVe	---	---	---	1.5	2.0	5.5
116E------------ Blocktown	VIIe	---	---	---	1.0	1.5	4.5
200**. Pits, gravel							
201**. Pits, quarry							
300**----------- Rock outcrop. Blocktown------	 VIIIs	---	---	---	---	---	---
400**. Urban land							

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	2,758	---	---	---
II	130,940	117,643	12,494	803
III	99,857	77,977	15,237	6,643
IV	41,867	39,150	2,717	---
V	9,255	---	9,255	---
VI	975	361	---	614
VII	7,966	7,657	---	309
VIII	185	185	---	---

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: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
1B-------------- Gaila	4A	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Virginia pine------- Shortleaf pine------	70 80 80 80	4 8 8 9	Yellow-poplar, eastern white pine, shortleaf pine, loblolly pine.
1C-------------- Gaila	3R	Moderate	Moderate	Moderate	Slight	Northern red oak---- Yellow-poplar------- Virginia pine------- Shortleaf pine------	60 80 70 70	3 5 8 8	Eastern white pine, shortleaf pine, loblolly pine.
2A, 2B, 2C------ Glenelg	4A	Slight	Slight	Slight	Slight	Black oak----------- Yellow-poplar------- Virginia pine------- Shortleaf pine------	78 87 70 70	4 6 8 8	Eastern white pine, black walnut, shortleaf pine, yellow-poplar, Virginia pine, Japanese larch.
2UB**, 2UC**:									
Glenelg--------	4A	Slight	Slight	Slight	Slight	Black oak----------- Yellow-poplar------- Virginia pine------- Shortleaf pine------	78 87 70 70	4 6 8 8	Eastern white pine, black walnut, shortleaf pine, yellow-poplar, Virginia pine, Japanese larch.
Urban land.									
4B, 4C---------- Elioak	4C	Slight	Moderate	Slight	Slight	Black oak----------- Yellow-poplar------- Virginia pine------- Shortleaf pine------	80 90 75 70	4 6 8 8	Loblolly pine, yellow-poplar, eastern white pine.
5A, 5B---------- Glenville	4W	Slight	Moderate	Moderate	Moderate	Northern red oak---- White ash----------- Sugar maple--------- Yellow-poplar-------	80 80 80 90	4 4 4 6	Yellow-poplar, Japanese larch, eastern white pine, Norway spruce.
6A-------------- Baile	4W	Slight	Moderate	Moderate	Slight	Pin oak------------- American holly------ Red maple-----------	85+ --- ---	4 --- ---	Eastern white pine, Norway spruce, white spruce.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordi- nation symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
7UB**:									
Gaila----------	4A	Slight	Slight	Slight	Slight	Northern red oak----	70	4	Yellow-poplar, eastern white pine, shortleaf pine, loblolly pine.
						Yellow-poplar-------	80	8	
						Virginia pine-------	80	8	
						Shortleaf pine------	80	9	
Urban land.									
7UC**:									
Gaila----------	3R	Moderate	Moderate	Moderate	Slight	Northern red oak----	60	3	Eastern white pine, shortleaf pine, loblolly pine.
						Yellow-poplar-------	80	5	
						Virginia pine-------	70	8	
						Shortleaf pine------	70	8	
Urban land.									
9B**, 9C**:									
Linganore------	4F	Slight	Slight	Moderate	Slight	Black oak-----------	70	4	Eastern white pine, Virginia pine.
						Virginia pine-------	70	8	
						Yellow-poplar-------	80	5	
Hyattstown-----	4D	Slight	Slight	Moderate	Severe	Northern red oak----	75	4	Virginia pine, eastern white pine.
						White oak-----------	60	3	
16B**, 16C**:									
Brinklow-------	4D	Slight	Slight	Slight	Slight	Northern red oak----	80	4	Eastern white pine, yellow-poplar, Virginia pine.
						Yellow-poplar-------	90	6	
						White oak-----------	70	4	
						Black oak-----------	75	4	
Blocktown------	4D	Slight	Slight	Moderate	Severe	Black oak-----------	70	4	Virginia pine, eastern white pine.
						Virginia pine-------	70	8	
						White oak-----------	60	3	
						Northern red oak----	75	4	
16D**:									
Brinklow-------	4R	Moderate	Moderate	Slight	Moderate	Northern red oak----	80	4	Eastern white pine, yellow-poplar, Virginia pine.
						Yellow-poplar-------	90	6	
						White oak-----------	70	4	
						Black oak-----------	75	4	
Blocktown------	4R	Moderate	Moderate	Moderate	Severe	Black oak-----------	70	4	Virginia pine, eastern white pine.
						Virginia pine-------	70	8	
						White oak-----------	60	3	
						Northern red oak----	75	4	
17B, 17C-------- Occoquan	3A	Slight	Slight	Moderate	Slight	Northern red oak----	62	3	Eastern white pine, yellow-poplar, hemlock, shortleaf pine.
						Virginia pine-------	60	3	
						White oak-----------	60	6	
						Yellow-poplar-------	70	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
18C------------- Penn	3A	Slight	Slight	Slight	Slight	Northern red oak----	67	3	Yellow-poplar, Virginia pine, Norway spruce, European larch, loblolly pine.
						Yellow-poplar-------	75	4	
						Virginia pine-------	69	8	
						Shortleaf pine------	70	8	
18E------------- Penn	3R	Severe	Severe	Slight	Slight	Northern red oak----	67	3	Yellow-poplar, Virginia pine, Norway spruce, European larch, loblolly pine.
						Yellow-poplar-------	75	4	
						Virginia pine-------	69	8	
						Shortleaf pine------	70	8	
19A, 19B-------- Bucks	4A	Slight	Slight	Slight	Slight	Northern red oak----	68	4	Eastern white pine, yellow-poplar, Norway spruce, Japanese larch, Virginia pine.
						Yellow-poplar-------	80	5	
20A, 20B, 20C--- Brentsville	3A	Slight	Slight	Slight	Slight	Northern red oak----	67	3	Eastern white pine, Scotch pine.
						Virginia pine-------	69	8	
						White oak-----------	67	3	
21A, 21B, 21C--- Penn	3A	Slight	Slight	Slight	Slight	Northern red oak----	67	3	Yellow-poplar, Virginia pine, Norway spruce, Japanese larch.
						Yellow-poplar-------	75	4	
						Virginia pine-------	69	8	
						Shortleaf pine------	70	8	
21D------------- Penn	3R	Moderate	Moderate	Slight	Slight	Northern red oak----	67	3	Yellow-poplar, Virginia pine, Norway spruce, Japanese larch.
						Yellow-poplar-------	75	4	
						Virginia pine-------	69	8	
						Shortleaf pine------	70	8	
21E------------- Penn	3R	Severe	Severe	Slight	Slight	Northern red oak----	67	3	Yellow-poplar, Virginia pine, Norway spruce, Japanese larch.
						Yellow-poplar-------	75	4	
						Virginia pine-------	69	8	
						Shortleaf pine------	70	8	
21F**:									
Nestoria-------	2R	Moderate	Severe	Severe	Moderate	Northern red oak----	50	2	Eastern white pine, Scotch pine.
						Virginia pine-------	50	5	
Rock outcrop.									
22A, 22B-------- Readington	4A	Slight	Slight	Slight	Slight	Northern red oak----	74	4	Eastern white pine, Japanese larch, yellow-poplar, Norway spruce.
						Yellow-poplar-------	80	5	
						Virginia pine-------	75	8	
						Shortleaf pine------	75	8	
23A------------- Croton	3W	Slight	Severe	Severe	Slight	Pin oak-------------	65	3	Eastern white pine, pin oak.
						Swamp white oak-----	---	---	
						Red maple-----------	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
24C------------- Montalto	4C	Slight	Moderate	Slight	Slight	Black oak-----------	76	4	Eastern white pine, yellow-poplar, black walnut, loblolly pine.
						Yellow-poplar-------	90	6	
						Virginia pine-------	75	8	
						Shortleaf pine------	75	8	
						Eastern white pine--	90	12	
24D------------- Montalto	4C	Moderate	Moderate	Slight	Slight	Black oak-----------	76	4	Eastern white pine, yellow-poplar, black walnut, loblolly pine.
						Yellow-poplar-------	90	6	
						Virginia pine-------	75	8	
						Shortleaf pine------	75	8	
						Eastern white pine--	90	12	
25B, 25C-------- Legore	4A	Slight	Slight	Slight	Slight	Black oak-----------	75	4	Yellow-poplar, Virginia pine, loblolly pine, eastern white pine.
						Yellow-poplar-------	85	6	
						Virginia pine-------	75	8	
						Shortleaf pine------	75	8	
26B, 26C-------- Montalto	4C	Slight	Moderate	Slight	Slight	Black oak-----------	76	4	Eastern white pine, yellow-poplar, black walnut, loblolly pine.
						Yellow-poplar-------	90	6	
						Virginia pine-------	75	8	
						Shortleaf pine------	75	8	
						Eastern white pine--	90	12	
27B, 27C-------- Neshaminy	4A	Slight	Slight	Slight	Slight	Northern red oak----	80	4	Eastern white pine, yellow-poplar, black walnut, Virginia pine.
						Yellow-poplar-------	90	6	
28A------------- Watchung	4W	Slight	Severe	Severe	Slight	Black oak-----------	80	4	Eastern white pine, European larch, Norway spruce.
						Pin oak-------------	85	5	
29B------------- Jackland	6C	Slight	Moderate	Moderate	Moderate	Northern red oak----	60	3	Eastern white pine.
						Loblolly pine-------	70	6	
						Yellow-poplar-------	74	4	
						Virginia pine-------	60	6	
35B**:									
Chrome---------	3C	Slight	Slight	Moderate	Slight	Northern red oak----	60	3	Eastern white pine, Virginia pine.
						Virginia pine-------	60	6	
Conowingo------	4W	Slight	Moderate	Slight	Slight	Black oak-----------	70	4	Eastern white pine, Norway spruce, Virginia pine.
						White oak-----------	80	4	
						Yellow-poplar-------	70	4	
35C------------- Chrome	3C	Slight	Slight	Moderate	Slight	Northern red oak----	60	3	Eastern white pine, Virginia pine.
						Virginia pine-------	60	6	
36A------------- Conowingo	4W	Slight	Moderate	Slight	Slight	Black oak-----------	70	4	Eastern white pine, Norway spruce, Virginia pine.
						White oak-----------	80	4	
						Yellow-poplar-------	70	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
37B------------- Travilah	3W	Slight	Moderate	Slight	Slight	Black oak-----------	60	3	Eastern white pine, Virginia pine.
						Northern red oak----	60	3	
						White oak-----------	60	3	
						Virginia pine-------	60	6	
41A, 41B-------- Elsinboro	4A	Slight	Slight	Slight	Slight	Black oak-----------	80	4	Eastern white pine, yellow-poplar, loblolly pine.
						Yellow-poplar-------	90	6	
						Virginia pine-------	80	8	
						Eastern white pine--	---	---	
						Shortleaf pine------	---	---	
						Northern red oak----	---	---	
						White oak-----------	---	---	
						Red maple-----------	---	---	
						Hickory-------------	---	---	
43A------------- Elk	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	94	7	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white oak, northern red oak, cherrybark oak, white ash, shortleaf pine.
						Cherrybark oak------	95	9	
						Pin oak-------------	96	6	
						Hackberry-----------	---	---	
						Red maple-----------	---	---	
						American sycamore---	---	---	
						Black walnut--------	---	---	
						Sweetgum------------	98	9	
45A------------- Delanco	4W	Slight	Slight	Slight	Slight	Black oak-----------	80	4	Eastern white pine, yellow-poplar.
						Yellow-poplar-------	90	6	
46A------------- Huntington	5A	Slight	Slight	Slight	Slight	Northern red oak----	85	5	Yellow-poplar, black walnut, black locust, eastern white pine.
						Yellow-poplar-------	95	7	
47A------------- Lindside	5A	Slight	Slight	Slight	Slight	Northern red oak----	86	5	Northern red oak, yellow-poplar, black walnut, white ash, white oak, eastern white pine, Norway spruce, Japanese larch, black oak, shortleaf pine, Virginia pine.
						Yellow-poplar-------	95	7	
						Black walnut--------	---	---	
						White ash-----------	85	4	
						White oak-----------	85	5	
						Red maple-----------	---	---	
48A------------- Melvin	7W	Slight	Moderate	Moderate	Severe	Pin oak-------------	99	7	Pin oak, American sycamore, sweetgum, loblolly pine, eastern cottonwood, willow oak.
						Eastern cottonwood--	101	9	
						Sweetgum------------	89	7	
						Green ash-----------	---	---	
						Hackberry-----------	---	---	
						Hickory-------------	---	---	
						Red maple-----------	---	---	
						American elm--------	---	---	
						Cherrybark oak------	91	8	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
50A------------- Rowland	4W	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar-------	80 95	4 7	Eastern white pine, yellow-poplar, loblolly pine, Norway spruce, European larch.
51A**: Bowmansville---	5W	Slight	Severe	Severe	Moderate	Pin oak------------	85	5	Eastern white pine, white spruce.
Melvin---------	7W	Slight	Moderate	Moderate	Severe	Pin oak------------ Eastern cottonwood-- Sweetgum----------- Green ash---------- Hackberry---------- Hickory------------ Red maple---------- American elm-------- Cherrybark oak------	99 101 89 --- --- --- --- --- 91	7 9 7 --- --- --- --- --- 8	Pin oak, American sycamore, sweetgum, loblolly pine, eastern cottonwood, willow oak.
53A------------- Codorus	5W	Slight	Moderate	Slight	Slight	Northern red oak---- White ash---------- Sugar maple--------- Yellow-poplar------- Eastern white pine-- Black walnut--------	90 90 90 100 100 100	5 5 4 8 10 ---	Yellow-poplar, black walnut, white ash, sugar maple, European larch, Norway spruce, eastern white pine.
54A------------- Hatboro	3W	Slight	Severe	Slight	Moderate	Red maple---------- American sycamore--- Pin oak------------	60 60 60	3 --- 3	Eastern white pine, white spruce.
55C------------- Evesboro	6S	Slight	Moderate	Slight	Slight	Shortleaf pine------ Pitch pine---------- Virginia pine------- Black oak----------- White oak----------- Chestnut oak--------	60 60 70 70 70 70	6 --- 8 4 4 4	Virginia pine, loblolly pine.
57B, 57C-------- Chillum	4A	Slight	Slight	Slight	Moderate	White oak----------- Yellow-poplar------- Loblolly pine------- Virginia pine-------	70 80 80 70	4 5 8 8	Eastern white pine, loblolly pine, yellow-poplar.
57D------------- Chillum	4R	Moderate	Moderate	Slight	Moderate	White oak----------- Yellow-poplar------- Loblolly pine------- Virginia pine-------	70 80 80 70	4 5 8 8	Eastern white pine, loblolly pine, yellow-poplar.
57UB**: Chillum--------	4A	Slight	Slight	Slight	Moderate	White oak----------- Yellow-poplar------- Loblolly pine------- Virginia pine-------	70 80 80 70	4 5 8 8	Eastern white pine, loblolly pine, yellow-poplar.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
57UB**:									
Urban land.									
58B, 58C-------- Sassafras	4A	Slight	Slight	Slight	Slight	White oak----------- Yellow-poplar------- Loblolly pine------- Virginia pine-------	70 80 85 70	4 5 8 8	Loblolly pine, eastern white pine, yellow-poplar.
59A, 59B-------- Beltsville	4W	Slight	Moderate	Moderate	Moderate	Black oak----------- Virginia pine------- Loblolly pine------- White oak----------- Pin oak------------- Sweetgum------------ Red maple-----------	70 70 70 --- --- --- ---	4 8 6 --- --- --- ---	Virginia pine, loblolly pine.
61B, 61C-------- Croom	3D	Slight	Slight	Moderate	Moderate	White oak----------- Virginia pine-------	60 60	3 6	Loblolly pine, Virginia pine.
61D, 61E-------- Croom	3D	Moderate	Moderate	Moderate	Moderate	White oak----------- Virginia pine-------	60 60	3 6	Loblolly pine, Virginia pine.
61UB**:									
Croom----------	3D	Slight	Slight	Moderate	Moderate	White oak----------- Virginia pine-------	60 60	3 6	Loblolly pine, Virginia pine.
Urban land.									
64B**, 64C**:									
Croom----------	3D	Slight	Slight	Moderate	Moderate	White oak----------- Virginia pine-------	60 60	3 6	Loblolly pine, Virginia pine.
Bucks----------	4A	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar-------	68 80	4 5	Eastern white pine, yellow-poplar, Norway spruce, Japanese larch, Virginia pine.
65B------------- Wheaton	4R	Slight	Slight	Slight	Slight	Northern red oak---- White oak----------- Yellow-poplar-------	68 78 87	4 4 6	Black walnut, yellow-poplar, eastern white pine, loblolly pine, western larch.
66UB**, 66UC**:									
Wheaton--------	4R	Slight	Slight	Slight	Slight	Northern red oak---- White oak----------- Yellow-poplar-------	68 78 87	4 4 6	Black walnut, yellow-poplar, eastern white pine, loblolly pine, western larch.
Urban land.									
67UB**:									
Urban land.									

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
67UB**:									
Wheaton	4R	Slight	Slight	Slight	Slight	Northern red oak	68	4	Black walnut, yellow-poplar, eastern white pine, loblolly pine, western larch.
						White oak	78	4	
						Yellow-poplar	87	6	
109D Hyattstown	4R	Moderate	Moderate	Moderate	Severe	Northern red oak	75	4	Virginia pine, eastern white pine.
						White oak	60	3	
109E Hyattstown	4R	Severe	Severe	Severe	Severe	Northern red oak	75	4	Virginia pine, eastern white pine.
						White oak	60	3	
116C Blocktown	4D	Slight	Slight	Moderate	Severe	Black oak	70	4	Virginia pine, eastern white pine.
						Virginia pine	70	8	
						White oak	60	3	
						Northern red oak	75	4	
116D Blocktown	4R	Moderate	Moderate	Moderate	Severe	Black oak	70	4	Virginia pine, eastern white pine.
						Virginia pine	70	8	
						White oak	60	3	
						Northern red oak	75	4	
116E Blocktown	4R	Severe	Severe	Moderate	Severe	Black oak	70	4	Virginia pine, eastern white pine.
						Virginia pine	70	8	
						White oak	60	3	
						Northern red oak	75	4	
300**:									
Rock outcrop.									
Blocktown	4D	Slight	Slight	Moderate	Severe	Black oak	70	4	Virginia pine, eastern white pine.
						Virginia pine	70	8	
						White oak	60	3	
						Northern red oak	75	4	

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

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--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
1B: Gaila	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
1C: Gaila	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
2A: Glenelg	Slight	Slight	Moderate: small stones.	Slight	Slight.
2B: Glenelg	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
2C: Glenelg	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
2UB*:					
Glenelg	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Urban land.					
2UC*:					
Glenelg	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Urban land.					
4B: Elioak	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones, droughty.
4C: Elioak	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, droughty, slope.
5A, 5B: Glenville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
6A: Baile	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
7UB*:					
Gaila	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Urban land.					
7UC*:					
Gaila	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Urban land.					

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
9B*:					
Linganore	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight	Moderate: small stones, large stones.
Hyattstown	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight	Severe: depth to rock.
9C*:					
Linganore	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones.
Hyattstown	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: depth to rock.
16B*:					
Brinklow	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight	Moderate: small stones, large stones.
Blocktown	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight	Severe: depth to rock.
16C*:					
Brinklow	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones.
Blocktown	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: depth to rock.
16D*:					
Brinklow	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Blocktown	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
17B Occoquan	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
17C Occoquan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
18C Penn	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
18E Penn	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
19A Bucks	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Severe: erodes easily.	Slight.
19B Bucks	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
20A, 20B Brentsville	Slight	Slight	Moderate: slope, small stones, depth to rock.	Slight	Moderate: depth to rock.
20C Brentsville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
21A Penn	Slight	Slight	Moderate: small stones.	Slight	Moderate: depth to rock.
21B Penn	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: depth to rock.
21C Penn	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
21D Penn	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
21E Penn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
21F*: Nestoria	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: small stones, depth to rock, slope.
Rock outcrop.					
22A Readington	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, wetness.	Severe: erodes easily.	Moderate: wetness.
22B Readington	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Severe: erodes easily.	Moderate: wetness.
23A Croton	Severe: wetness, cemented pan.	Severe: wetness, cemented pan.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness, cemented pan.
24C Montalto	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Slight	Moderate: large stones, slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
24D------------------- Montalto	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: slope.	Severe: slope.
25B------------------- Legore	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
25C------------------- Legore	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
26B------------------- Montalto	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight----------	Slight.
26C------------------- Montalto	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
27B------------------- Neshaminy	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Moderate: large stones.
27C------------------- Neshaminy	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: large stones, slope.
28A------------------- Watchung	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
29B------------------- Jackland	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
35B*:					
Chrome---------------	Slight----------	Slight----------	Moderate: slope, depth to rock.	Slight----------	Moderate: thin layer.
Conowingo------------	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Severe: erodes easily.	Moderate: wetness.
35C------------------- Chrome	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: thin layer, slope.
36A------------------- Conowingo	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness.	Severe: erodes easily.	Moderate: wetness.
37B------------------- Travilah	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, depth to rock.
41A------------------- Elsinboro	Slight----------	Slight----------	Moderate: small stones.	Severe: erodes easily.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
41B: Elsinboro	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.	Slight.
43A: Elk	Severe: flooding.	Slight	Moderate: flooding.	Severe: erodes easily.	Moderate: flooding.
45A: Delanco	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness, flooding.
46A: Huntington	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
47A: Lindside	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: flooding.
48A: Melvin	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
50A: Rowland	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
51A*:					
Bowmansville	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Melvin	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
53A: Codorus	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
54A: Hatboro	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: flooding, wetness.
55C: Evesboro	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Severe: droughty.
57B: Chillum	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
57C: Chillum	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
57D: Chillum	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
57UB*:					
Chillum	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
57UB*:					
Urban land.					
58B----------- Sassafras	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight-----------	Slight.
58C----------- Sassafras	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight-----------	Moderate: slope.
59A, 59B----------- Beltsville	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
61B----------- Croom	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Severe: erodes easily.	Moderate: small stones.
61C----------- Croom	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: small stones, slope.
61D----------- Croom	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: erodes easily.	Severe: slope.
61E----------- Croom	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope, erodes easily.	Severe: slope.
61UB*:					
Croom-----------	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Severe: erodes easily.	Moderate: small stones.
Urban land.					
64B*:					
Croom-----------	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Severe: erodes easily.	Moderate: small stones.
Bucks-----------	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
64C*:					
Croom-----------	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: small stones, slope.
Bucks-----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
65B------------------- Wheaton	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
66UB*:					
Wheaton--------------	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
Urban land.					
66UC*:					
Wheaton--------------	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Urban land.					
67UB*:					
Urban land.					
Wheaton--------------	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
100*. Dumps, refuse					
109D------------------ Hyattstown	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
109E------------------ Hyattstown	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
116C------------------ Blocktown	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight----------	Severe: depth to rock.
116D------------------ Blocktown	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
116E------------------ Blocktown	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
200*. Pits, gravel					
201*. Pits, quarry					

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
300*:					
Rock outcrop.					
Blocktown	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: depth to rock.
400*.					
Urban land					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--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
1B----------------- Gaila	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
1C----------------- Gaila	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
2A----------------- Glenelg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
2B----------------- Glenelg	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
2C----------------- Glenelg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
2UB*:										
Glenelg-----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
2UC*:										
Glenelg-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
4B----------------- Elioak	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
4C----------------- Elioak	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
5A----------------- Glenville	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
5B----------------- Glenville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
6A----------------- Baile	Poor	Fair	Good	Fair	Fair	Good	Fair	Fair	Fair	Fair.
7UB*:										
Gaila-------------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
7UC*:										
Gaila-------------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										

See footnote at end of table.

TABLE 10.--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
9B*:										
Linganore	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Hyattstown	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
9C*:										
Linganore	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Hyattstown	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
16B*:										
Brinklow	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Blocktown	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Poor	Very poor.	Very poor.
16C*:										
Brinklow	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Blocktown	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
16D*:										
Brinklow	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Blocktown	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
17B, 17C Occoquan	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
18C, 18E Penn	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
19A Bucks	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
19B Bucks	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
20A, 20B Brentsville	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
20C Brentsville	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
21A, 21B Penn	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
21C Penn	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
21D------ Penn	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
21E------ Penn	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
21F*:										
Nestoria------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Rock outcrop.										
22A------ Readington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
22B------ Readington	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
23A------ Croton	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
24C, 24D------ Montalto	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
25B, 25C------ Legore	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
26B------ Montalto	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
26C------ Montalto	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27B------ Neshaminy	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
27C------ Neshaminy	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
28A------ Watchung	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
29B------ Jackland	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
35B*:										
Chrome------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Conowingo------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
35C------ Chrome	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
36A------ Conowingo	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
37B------ Travilah	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Good	Poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
41A, 41B: Elsinboro	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
43A: Elk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
45A: Delanco	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
46A: Huntington	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
47A: Lindside	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
48A: Melvin	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
50A: Rowland	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
51A*:										
Bowmansville	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Melvin	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
53A: Codorus	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
54A: Hatboro	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
55C: Evesboro	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
57B, 57C: Chillum	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
57D: Chillum	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
57UB*:										
Chillum	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
58B, 58C: Sassafras	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
59A: Beltsville	Good	Good	Good	Good	Poor	Poor	Poor	Good	Good	Poor.
59B: Beltsville	Fair	Good	Good	Good	Poor	Very poor.	Very poor.	Good	Good	Very poor.
61B, 61C: Croom	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
61D: Croom	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
61E: Croom	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Fair	Very poor.
61UB*:										
Croom	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Urban land.										
64B*:										
Croom	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Bucks	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
64C*:										
Croom	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Bucks	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
65B: Wheaton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
66UB*:										
Wheaton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
66UC*:										
Wheaton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
67UB*:										
Urban land.										
Wheaton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
100*. Dumps, refuse										
109D: Hyattstown	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
109E: Hyattstown	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
116C, 116D, 116E: Blocktown	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.

See footnote at end of table.

TABLE 10.--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
200*. Pits, gravel										
201*. Pits, quarry										
300*: Rock outcrop.										
Blocktown	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Poor	Very poor.	Very poor.
400*. Urban land										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1B Gaila	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
1C Gaila	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
2A Glenelg	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.
2B Glenelg	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
2C Glenelg	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
2UB*:						
Glenelg	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Urban land.						
2UC*:						
Glenelg	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Urban land.						
4B Elioak	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Moderate: large stones, droughty.
4C Elioak	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, droughty, slope.
5A, 5B Glenville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
6A Baile	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
7UB*:						
Gaila	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Urban land.						

See footnote at end of table.

TABLE 11.--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
7UC*:						
Gaila	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Urban land.						
9B*:						
Linganore	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, large stones.
Hyattstown	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Severe: depth to rock.
9C*:						
Linganore	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones.
Hyattstown	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: depth to rock.
16B*:						
Brinklow	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Moderate: depth to rock, shrink-swell.	Moderate: small stones, large stones.
Blocktown	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Severe: depth to rock.
16C*:						
Brinklow	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, shrink-swell, slope.	Moderate: small stones, large stones.
Blocktown	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: depth to rock.
16D*:						
Brinklow	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Blocktown	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
17B Occoquan	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.

See footnote at end of table.

TABLE 11.--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
17C--------------- Occoquan	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
18C--------------- Penn	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones, slope.
18E--------------- Penn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
19A--------------- Bucks	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, frost action.	Slight.
19B--------------- Bucks	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
20A--------------- Brentsville	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock, frost action.	Moderate: depth to rock.
20B--------------- Brentsville	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Moderate: depth to rock.
20C--------------- Brentsville	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: slope, depth to rock.
21A--------------- Penn	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Slight---------	Moderate: frost action.	Moderate: depth to rock.
21B--------------- Penn	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: depth to rock.
21C--------------- Penn	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock.
21D, 21E---------- Penn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
21F*: Nestoria---------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, depth to rock, slope.
Rock outcrop.						
22A--------------- Readington	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
22B--------------- Readington	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--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
23A--------------- Croton	Severe: cemented pan, wetness.	Severe: wetness.	Severe: wetness, cemented pan.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness, cemented pan.
24C--------------- Montalto	Moderate: too clayey, dense layer, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: large stones, slope.
24D--------------- Montalto	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
25B--------------- Legore	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
25C--------------- Legore	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
26B--------------- Montalto	Moderate: too clayey, dense layer.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
26C--------------- Montalto	Moderate: too clayey, dense layer, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
27B--------------- Neshaminy	Moderate: depth to rock, large stones.	Moderate: large stones.	Moderate: depth to rock, large stones.	Moderate: slope, large stones.	Moderate: frost action, large stones.	Moderate: large stones.
27C--------------- Neshaminy	Moderate: depth to rock, large stones, slope.	Moderate: slope, large stones.	Moderate: depth to rock, slope, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Moderate: large stones, slope.
28A--------------- Watchung	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
29B--------------- Jackland	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
35B*:						
Chrome-----------	Severe: depth to rock.	Moderate: depth to rock, shrink-swell.	Severe: depth to rock.	Moderate: slope, depth to rock, shrink-swell.	Moderate: depth to rock, low strength, shrink-swell.	Moderate: thin layer.
Conowingo--------	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--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
35C--------------- Chrome	Severe: depth to rock.	Moderate: slope, depth to rock, shrink-swell.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, low strength, slope.	Moderate: thin layer, slope.
36A--------------- Conowingo	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Moderate: wetness.
37B--------------- Travilah	Severe: depth to rock, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: frost action.	Moderate: wetness, depth to rock.
41A--------------- Elsinboro	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Severe: low strength.	Slight.
41B--------------- Elsinboro	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Severe: low strength.	Slight.
43A--------------- Elk	Moderate: too clayey, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
45A--------------- Delanco	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
46A--------------- Huntington	Severe: deep to water.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
47A--------------- Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
48A--------------- Melvin	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
50A--------------- Rowland	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: wetness, flooding.
51A*:						
Bowmansville-----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness.
Melvin-----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
53A--------------- Codorus	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: flooding, frost action.	Moderate: flooding, wetness.

See footnote at end of table.

TABLE 11.--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
54A-------------- Hatboro	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, frost action.	Severe: flooding, wetness.
55C-------------- Evesboro	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
57B-------------- Chillum	Slight---------	Slight---------	Slight---------	Moderate: slope.	Severe: low strength, frost action.	Slight.
57C-------------- Chillum	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
57D-------------- Chillum	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
57UB*:						
Chillum----------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Severe: low strength, frost action.	Slight.
Urban land.						
58B-------------- Sassafras	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
58C-------------- Sassafras	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
59A-------------- Beltsville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
59B-------------- Beltsville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
61B-------------- Croom	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
61C-------------- Croom	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, slope.
61D, 61E---------- Croom	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
61UB*:						
Croom------------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
Urban land.						

See footnote at end of table.

TABLE 11.--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
64B*:						
Croom	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
Bucks	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
64C*:						
Croom	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, slope.
Bucks	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: slope.
65B Wheaton	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
66UB*:						
Wheaton	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Urban land.						
66UC*:						
Wheaton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Urban land.						
67UB*:						
Urban land.						
Wheaton	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
100*. Dumps, refuse						
109D, 109E Hyattstown	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
116C Blocktown	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: depth to rock.
116D, 116E Blocktown	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
200*. Pits, gravel						
201*. Pits, quarry						

See footnote at end of table.

TABLE 11.--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
300*:						
Rock outcrop.						
Blocktown--------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Severe: depth to rock.
400*.						
Urban land						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1B Gaila	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
1C Gaila	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
2A Glenelg	Moderate: percs slowly.	Moderate: seepage.	Moderate: large stones.	Slight	Poor: seepage, large stones.
2B Glenelg	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: large stones.	Slight	Poor: seepage, large stones.
2C Glenelg	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, large stones.	Moderate: slope.	Poor: seepage, large stones.
2UB*:					
Glenelg	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: large stones.	Slight	Poor: seepage, large stones.
Urban land.					
2UC*:					
Glenelg	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, large stones.	Moderate: slope.	Poor: seepage, large stones.
Urban land.					
4B Elioak	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
4C Elioak	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
5A, 5B Glenville	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: wetness.
6A Baile	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
7UB*:					
Gaila	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
Urban land.					

See footnote at end of table.

TABLE 12.--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
7UC*:					
Gaila	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
Urban land.					
9B*:					
Linganore	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
Hyattstown	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
9C*:					
Linganore	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
Hyattstown	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
16B*:					
Brinklow	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
Blocktown	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
16C*:					
Brinklow	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
Blocktown	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
16D*:					
Brinklow	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Blocktown	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
17B Occoquan	Moderate: depth to rock.	Severe: seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: depth to rock, too sandy.

See footnote at end of table.

TABLE 12.--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
17C----------------- Occoquan	Moderate: depth to rock, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: depth to rock, too sandy, slope.
18C----------------- Penn	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
18E----------------- Penn	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
19A----------------- Bucks	Severe: percs slowly.	Moderate: seepage, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Fair: depth to rock, too clayey.
19B----------------- Bucks	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Fair: depth to rock, too clayey.
20A, 20B------------ Brentsville	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, small stones.
20C----------------- Brentsville	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, small stones.
21A, 21B------------ Penn	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
21C----------------- Penn	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
21D, 21E------------ Penn	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
21F*:					
Nestoria-----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop.					
22A, 22B------------ Readington	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, wetness.	Moderate: depth to rock, wetness.	Poor: small stones.

See footnote at end of table.

TABLE 12.--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
23A----------------- Croton	Severe: cemented pan, wetness, percs slowly.	Severe: cemented pan.	Severe: depth to rock, wetness.	Severe: cemented pan, wetness.	Poor: cemented pan, wetness.
24C----------------- Montalto	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
24D----------------- Montalto	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
25B----------------- Legore	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
25C----------------- Legore	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
26B----------------- Montalto	Severe: percs slowly.	Moderate: seepage, slope.	Severe: wetness, too clayey.	Slight-----------	Poor: too clayey, hard to pack.
26C----------------- Montalto	Severe: percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
27B----------------- Neshaminy	Severe: percs slowly.	Moderate: depth to rock, slope, large stones.	Severe: depth to rock.	Moderate: depth to rock.	Poor: hard to pack, small stones.
27C----------------- Neshaminy	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Poor: hard to pack, small stones.
28A----------------- Watchung	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
29B----------------- Jackland	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
35B*:					
Chrome-------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Conowingo----------	Severe: wetness, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: small stones.

See footnote at end of table.

TABLE 12.--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
35C------------------ Chrome	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
36A------------------ Conowingo	Severe: wetness, percs slowly.	Moderate: seepage, depth to rock.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: small stones.
37B------------------ Travilah	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: depth to rock, wetness.
41A, 41B------------- Elsinboro	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Poor: small stones.
43A------------------ Elk	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey, thin layer.
45A------------------ Delanco	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
46A------------------ Huntington	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
47A------------------ Lindside	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
48A------------------ Melvin	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
50A------------------ Rowland	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
51A*:					
Bowmansville--------	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
Melvin--------------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
53A------------------ Codorus	Severe: flooding, wetness, poor filter.	Severe: flooding, wetness, seepage.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 12.--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
54A----------------- Hatboro	Severe: flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Poor: wetness.
55C----------------- Evesboro	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
57B----------------- Chillum	Severe: percs slowly.	Moderate: seepage, slope.	Slight-----------	Slight-----------	Poor: seepage, small stones.
57C----------------- Chillum	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: seepage, small stones.
57D----------------- Chillum	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: seepage, small stones, slope.
57UB*:					
Chillum------------	Severe: percs slowly.	Moderate: seepage, slope.	Slight-----------	Slight-----------	Poor: seepage, small stones.
Urban land.					
58B----------------- Sassafras	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Slight-----------	Fair: thin layer.
58C----------------- Sassafras	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: slope, thin layer.
59A, 59B------------ Beltsville	Severe: wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
61B----------------- Croom	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
61C----------------- Croom	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
61D, 61E------------ Croom	Severe: percs slowly, poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
61UB*:					
Croom--------------	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.

See footnote at end of table.

TABLE 12.--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
61UB*: Urban land.					
64B*: Croom	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Bucks	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Fair: depth to rock, too clayey.
64C*: Croom	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Bucks	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, too clayey, slope.
65B Wheaton	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.
66UB*: Wheaton	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.
Urban land.					
66UC*: Wheaton	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
Urban land.					
67UB*: Urban land.					
Wheaton	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.
100*. Dumps, refuse					
109D, 109E Hyattstown	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
116C Blocktown	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.

See footnote at end of table.

TABLE 12.--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
116D, 116E---------- Blocktown	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
200*. Pits, gravel					
201*. Pits, quarry					
300*: Rock outcrop.					
Blocktown----------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
400*. Urban land					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1B, 1C----------------- Gaila	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
2A, 2B, 2C------------ Glenelg	Good-----------------	Probable-------------	Probable-------------	Poor: area reclaim, small stones.
2UB*, 2UC*:				
Glenelg--------------	Good-----------------	Probable-------------	Probable-------------	Poor: area reclaim, small stones.
Urban land.				
4B, 4C---------------- Elioak	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
5A, 5B---------------- Glenville	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
6A-------------------- Baile	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
7UB*, 7UC*:				
Gaila----------------	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Urban land.				
9B*, 9C*:				
Linganore------------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Hyattstown-----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
16B*, 16C*:				
Brinklow-------------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Blocktown------------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
16D*:				
Brinklow-------------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
16D*:				
Blocktown	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
17B, 17C Occoquan	Fair: depth to rock, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
18C Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
18E Penn	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
19A, 19B Bucks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
20A, 20B, 20C Brentsville	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
21A, 21B, 21C Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
21D Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
21E Penn	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
21F*:				
Nestoria	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop.				
22A, 22B Readington	Fair: depth to rock, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
23A Croton	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: cemented pan, wetness.
24C, 24D Montalto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, small stones.
25B, 25C Legore	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
26B, 26C: Montalto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
27B, 27C: Neshaminy	Fair: depth to rock, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
28A: Watchung	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, wetness.
29B: Jackland	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
35B*:				
Chrome	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Conowingo	Fair: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
35C: Chrome	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
36A: Conowingo	Fair: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
37B: Travilah	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
41A, 41B: Elsinboro	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
43A: Elk	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
45A: Delanco	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
46A: Huntington	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
47A: Lindside	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
48A: Melvin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
50A------------------- Rowland	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
51A*:				
Bowmansville---------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
Melvin---------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
53A------------------- Codorus	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
54A------------------- Hatboro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
55C------------------- Evesboro	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
57B, 57C-------------- Chillum	Good-----------------	Probable-------------	Probable-------------	Poor: small stones, area reclaim.
57D------------------- Chillum	Fair: slope.	Probable-------------	Probable-------------	Poor: small stones, area reclaim, slope.
57UB*:				
Chillum--------------	Good-----------------	Probable-------------	Probable-------------	Poor: small stones, area reclaim.
Urban land.				
58B------------------- Sassafras	Good-----------------	Probable-------------	Probable-------------	Fair: too clayey, small stones.
58C------------------- Sassafras	Good-----------------	Probable-------------	Probable-------------	Fair: too clayey, small stones, slope.
59A, 59B-------------- Beltsville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, small stones.
61B, 61C-------------- Croom	Good-----------------	Probable-------------	Probable-------------	Poor: small stones, area reclaim.
61D------------------- Croom	Fair: slope.	Probable-------------	Probable-------------	Poor: small stones, area reclaim, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
61E Croom	Poor: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
61UB*:				
Croom	Good	Probable	Probable	Poor: small stones, area reclaim.
Urban land.				
64B*, 64C*:				
Croom	Good	Probable	Probable	Poor: small stones, area reclaim.
Bucks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
65B Wheaton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
66UB*, 66UC*:				
Wheaton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Urban land.				
67UB*:				
Urban land.				
Wheaton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
100*. Dumps, refuse				
109D Hyattstown	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
109E Hyattstown	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
116C Blocktown	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
116D Blocktown	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
116E------------------ Blocktown	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
200*. Pits, gravel				
201*. Pits, quarry				
300*: Rock outcrop.				
Blocktown------------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
400*. Urban land				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1B-----------------Gaila	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
1C-----------------Gaila	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
2A-----------------Glenelg	Moderate: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Favorable------	Large stones, erodes easily.	Large stones, erodes easily.
2B-----------------Glenelg	Moderate: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Large stones, erodes easily.	Large stones, erodes easily.
2C-----------------Glenelg	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
2UB*:							
Glenelg----------	Moderate: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Large stones, erodes easily.	Large stones, erodes easily.
Urban land.							
2UC*:							
Glenelg----------	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
Urban land.							
4B-----------------Elioak	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, droughty.	Erodes easily	Erodes easily, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
4C---------------- Elioak	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, droughty.	Slope, erodes easily.	Slope, erodes easily, droughty.
5A---------------- Glenville	Slight---------	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, rooting depth.	Wetness, rooting depth.
5B---------------- Glenville	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Wetness, rooting depth.	Wetness, rooting depth.
6A---------------- Baile	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
7UB*:							
Gaila------------	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Urban land.							
7UC*:							
Gaila------------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Urban land.							
9B*:							
Linganore--------	Moderate: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Large stones, depth to rock.	Large stones, droughty.
Hyattstown-------	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Depth to rock	Depth to rock.
9C*:							
Linganore--------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
9C*:							
Hyattstown-------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
16B*:							
Brinklow---------	Moderate: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Depth to rock	Depth to rock.
Blocktown--------	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
16C*, 16D*:							
Brinklow---------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Blocktown--------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
17B--------------- Occoquan	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily, too sandy.	Erodes easily.
17C--------------- Occoquan	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily.
18C, 18E---------- Penn	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
19A--------------- Bucks	Moderate: seepage, depth to rock.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
19B--------------- Bucks	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
20A--------------- Brentsville	Moderate: seepage, depth to rock.	Severe: seepage, piping.	Severe: no water.	Deep to water	Depth to rock	Depth to rock	Depth to rock.
20B--------------- Brentsville	Moderate: seepage, slope, depth to rock.	Severe: seepage, piping.	Severe: no water.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
20C--------------- Brentsville	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
21A--------------- Penn	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Depth to rock	Depth to rock	Depth to rock.
21B--------------- Penn	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Depth to rock	Depth to rock.
21C, 21D, 21E----- Penn	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
21F*:							
Nestoria----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop.							
22A--------------- Readington	Moderate: seepage, depth to rock.	Severe: piping.	Severe: no water.	Favorable------	Wetness, droughty.	Erodes easily, wetness.	Erodes easily, droughty.
22B--------------- Readington	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Slope----------	Slope, wetness, droughty.	Erodes easily, wetness.	Erodes easily, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
23A: Croton	Severe: cemented pan.	Severe: wetness.	Severe: no water.	Percs slowly, cemented pan, frost action.	Wetness, percs slowly, rooting depth.	Cemented pan, erodes easily, wetness.	Wetness, erodes easily, droughty.
24C, 24D: Montalto	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, rooting depth.	Slope	Slope, rooting depth.
25B: Legore	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
25C: Legore	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
26B: Montalto	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, rooting depth.	Favorable	Rooting depth.
26C: Montalto	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, rooting depth.	Slope	Slope, rooting depth.
27B: Neshaminy	Moderate: depth to rock, slope.	Severe: piping, hard to pack.	Severe: no water.	Deep to water	Slope, large stones.	Large stones	Large stones.
27C: Neshaminy	Severe: slope.	Severe: piping, hard to pack.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones.	Large stones, slope.
28A: Watchung	Moderate: seepage.	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
29B: Jackland	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
35B*:							
Chrome	Moderate: seepage, depth to rock, slope.	Severe: piping, hard to pack.	Severe: no water.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
35B*:							
Conowingo--------	Moderate: seepage, depth to rock, slope.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
35C--------------- Chrome	Severe: slope.	Severe: piping, hard to pack.	Severe: no water.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
36A--------------- Conowingo	Moderate: seepage, depth to rock.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
37B--------------- Travilah	Moderate: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Depth to rock, frost action, slope.	Slope, wetness, depth to rock.	Depth to rock, erodes easily.	Wetness, erodes easily.
41A--------------- Elsinboro	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
41B--------------- Elsinboro	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
43A--------------- Elk	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
45A--------------- Delanco	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Flooding, frost action.	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
46A--------------- Huntington	Moderate: seepage.	Severe: piping.	Severe: deep to water, slow refill.	Deep to water	Flooding-------	Favorable------	Favorable.
47A--------------- Lindside	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Flooding, frost action.	Flooding, wetness, erodes easily.	Wetness, erodes easily.	Erodes easily.
48A--------------- Melvin	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding-------	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
50A--------------- Rowland	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
51A*:							
Bowmansville-----	Severe: seepage.	Severe: piping, hard to pack, wetness.	Severe: slow refill, cutbanks cave.	Flooding, frost action.	Wetness, flooding.	Wetness--------	Wetness.
Melvin-----------	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding-------	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
53A--------------- Codorus	Severe: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness--------	Flooding, wetness.
54A--------------- Hatboro	Severe: seepage.	Severe: piping, wetness.	Slight---------	Flooding, frost action.	Wetness, flooding.	Wetness--------	Wetness.
55C--------------- Evesboro	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
57B--------------- Chillum	Moderate: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
57C, 57D---------- Chillum	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
57UB*:							
Chillum----------	Moderate: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Urban land.							
58B--------------- Sassafras	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope----------	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
58C: Sassafras	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
59A: Beltsville	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
59B: Beltsville	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
61B: Croom	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, slope, erodes easily.	Erodes easily, too sandy.	Erodes easily, droughty.
61C, 61D, 61E: Croom	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, slope, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
61UB*:							
Croom	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, slope, erodes easily.	Erodes easily, too sandy.	Erodes easily, droughty.
Urban land.							
64B*:							
Croom	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, slope, erodes easily.	Erodes easily, too sandy.	Erodes easily, droughty.
Bucks	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
64C*:							
Croom	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, slope, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily, droughty.
Bucks	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
65B---------------- Wheaton	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
66UB*:							
Wheaton----------	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Urban land.							
66UC*:							
Wheaton----------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Urban land.							
67UB*: Urban land.							
Wheaton----------	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
100*. Dumps, refuse							
109D, 109E-------- Hyattstown	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
116C, 116D, 116E-- Blocktown	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
200*. Pits, gravel							
201*. Pits, quarry							

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
300*:							
Rock outcrop.							
Blocktown--------	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
400*							
Urban land							

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--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: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
1B, 1C------------ Gaila	0-8	Silt loam--------	CL-ML, CL, ML	A-2, A-4, A-6	0-5	80-100	75-95	65-90	50-70	15-30	6-12
	8-17	Sandy clay loam, loam, sandy loam.	CL, SC	A-2, A-4, A-6	0-5	80-100	75-95	50-90	25-70	20-35	8-15
	17-20	Sandy loam, loam	CL-ML, SC-SM, CL, SC	A-2, A-4, A-6	0-10	80-95	70-95	45-90	25-70	15-30	6-12
	20-76	Loamy sand, sandy loam, loam.	SC-SM, CL-ML, SC	A-1, A-2, A-4	0-10	80-95	70-95	40-90	15-65	<30	NP-10
2A, 2B, 2C-------- Glenelg	0-8	Silt loam--------	ML	A-4, A-6	0	85-100	80-100	70-100	50-75	32-40	7-12
	8-28	Channery silt loam, silty clay loam, loam, silt loam.	GM, ML, SM	A-4, A-6, A-7	0-10	60-100	50-100	45-100	35-95	34-46	9-15
	28-60	Loam, sandy loam, channery loam.	GM, SM, ML	A-2, A-4	0-50	60-100	50-100	40-95	25-75	<40	NP-6
2UB*, 2UC*:											
Glenelg----------	0-8	Silt loam--------	ML	A-4, A-6	0	85-100	80-100	70-100	50-75	32-40	7-12
	8-28	Channery silt loam, silty clay loam, loam, silt loam.	GM, ML, SM	A-4, A-6, A-7	0-10	60-100	50-100	45-100	35-95	34-46	9-15
	28-60	Loam, sandy loam, channery loam.	GM, SM, ML	A-2, A-4	0-50	60-100	50-100	40-95	25-75	<40	NP-6
Urban land.											
4B, 4C------------ Elioak	0-15	Silt loam--------	ML, CL, SM, SC	A-4, A-6, A-7, A-2-4	0-10	85-100	80-100	55-100	30-90	30-45	5-20
	15-42	Silty clay loam, clay loam, silty clay.	CL, CH, MH, ML	A-6, A-7	0-5	85-100	80-100	75-100	60-95	35-58	11-26
	42-60	Silt loam, loam, gravelly fine sandy loam.	ML, SM, GM	A-4, A-5, A-2, A-1-b	0-5	65-100	50-100	35-100	20-90	35-50	NP-10
5A, 5B------------ Glenville	0-8	Silt loam--------	ML, SM	A-4	0	85-100	85-100	70-95	45-80	25-35	3-10
	8-30	Silt loam, channery loam, channery silty clay loam, gravelly silt loam.	CL-ML, CL, GM, SC	A-4, A-6	0-10	70-100	60-100	60-95	45-80	25-40	5-13
	30-40	Silt loam, channery loam, silty clay loam, gravelly silt loam.	CL-ML, CL, GM, SC	A-4, A-6	0-10	65-100	60-100	55-95	45-80	25-40	5-13
	40-70	Channery fine sandy loam, channery loam, very channery sandy loam.	CL-ML, ML, GM, SM	A-4, A-2, A-1	0-20	45-90	20-75	10-75	5-65	25-35	5-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
6A--------------- Baile	0-8	Silt loam--------	ML, MH	A-4, A-6, A-7	0-10	85-100	80-100	70-100	50-95	33-67	7-24
	8-31	Silty clay loam, silt loam, clay loam.	CL	A-6	0	90-100	80-100	70-100	55-95	28-34	11-14
	31-62	Loam, sandy loam, silt loam.	ML, CL, SC, SM	A-2, A-4, A-6	0	80-100	80-100	50-100	25-90	<35	NP-11
7UB*, 7UC*: Gaila-----------	0-8	Silt loam--------	CL-ML, CL, ML	A-2, A-4, A-6	0-5	80-100	75-95	65-90	50-70	15-30	6-12
	8-17	Sandy clay loam, loam, sandy loam.	CL, SC	A-2, A-4, A-6	0-5	80-100	75-95	50-90	25-70	20-35	8-15
	17-20	Sandy loam, loam	CL-ML, SC-SM, CL, SC	A-2, A-4, A-6	0-10	80-95	70-95	45-90	25-70	15-30	6-12
	20-76	Loamy sand, sandy loam, loam.	SC-SM, CL-ML, SC	A-1, A-2, A-4	0-10	80-95	70-95	40-90	15-65	<30	NP-10
Urban land.											
9B*, 9C*: Linganore-------	0-11	Channery silt loam.	GC	A-2, A-6	2-10	60-80	50-75	40-75	30-70	25-35	10-15
	11-17	Very channery silt loam, very channery silty clay loam.	GC	A-2	2-25	35-55	30-55	25-55	20-50	30-45	10-20
	17-22	Extremely channery silt loam, extremely channery silty clay loam.	GC	A-2	2-25	20-35	10-30	10-30	5-30	25-40	10-20
	22-51	Weathered bedrock	---	---	---	---	---	---	---	---	---
	51	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hyattstown------	0-9	Channery silt loam.	CL, CL-ML, GC, GM-GC	A-4, A-6, A-2-4	0-5	55-80	50-75	40-75	30-70	20-30	5-15
	9-14	Very channery silt loam, very channery clay loam.	GC, GM, SM, SC	A-2, A-6, A-7	0-5	40-85	30-55	25-55	20-50	30-50	10-20
	14-18	Extremely channery silt loam, very channery silt loam, extremely channery clay loam.	GC, SC, GM-GC	A-2, A-4, A-6, A-1	5-10	25-85	10-55	10-55	7-45	20-30	5-15
	18-26	Weathered bedrock	---	---	---	---	---	---	---	---	---
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
16B*, 16C*, 16D*:											
Brinklow--------	0-10	Channery silt loam.	GC, CL, GM-GC, CL-ML	A-4, A-6	5-15	60-95	50-75	50-65	40-55	20-35	5-15
	10-25	Loam, silty clay loam, channery silt loam.	GC, CL, SC	A-6, A-7	5-15	60-95	50-90	50-85	35-70	25-50	10-25
	25-35	Weathered bedrock	---	---	---	---	---	---	---	---	---
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blocktown-------	0-6	Channery silt loam.	CL-ML, CL, GM-GC, GC	A-2, A-4, A-6	0-10	65-85	55-75	45-70	30-65	15-30	5-15
	6-17	Very channery loam, very channery silty clay loam, extremely channery silt loam.	GC, GM	A-2, A-6, A-7	5-10	30-60	25-55	20-50	15-45	30-50	10-20
	17-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
17B, 17C--------- Occoquan	0-8	Loam-------------	CL-ML, ML, CL	A-4, A-6	1-5	80-100	75-95	65-90	50-70	<35	NP-15
	8-15	Loam, sandy loam, sandy clay loam.	CL, SC	A-6	1-5	80-100	75-95	50-70	40-70	25-40	10-25
	15-59	Loam, sandy loam, loamy sand.	CL-ML, SC-SM, SC, CL	A-2, A-4	2-10	80-95	75-80	50-70	15-65	<25	NP-10
	59	Weathered bedrock	---	---	---	---	---	---	---	---	---
18C, 18E--------- Penn	0-9	Very stony silt loam.	ML, GM	A-4	3-15	60-100	50-100	45-95	35-85	---	---
	9-21	Channery silt loam, channery loam, silt loam.	ML, SM, GM	A-4, A-2	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	21-36	Very channery silt loam, very channery loam, extremely channery silt loam.	ML, CL, SM, GM	A-4, A-2, A-1	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
19A, 19B--------- Bucks	0-12	Silt loam--------	ML, CL-ML, CL	A-4	0	95-100	95-100	85-95	65-90	20-35	3-10
	12-33	Silt loam, silty clay loam, channery loam.	ML, CL	A-4, A-6	0-3	75-100	60-80	55-75	50-70	30-40	5-15
	33-45	Channery silt loam, silt loam, silty clay loam.	ML, CL, SC, SM	A-4, A-6	5-15	65-90	55-85	50-80	45-75	20-40	3-15
	45	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
20A, 20B, 20C---- Brentsville	0-10	Sandy loam-------	SM, SC-SM	A-2	0-5	85-100	75-95	45-65	25-35	8-20	NP-6
	10-33	Loam, sandy loam, gravelly sandy loam.	SC, SM, SC-SM	A-1, A-2, A-4	0-10	75-100	50-95	30-85	15-50	10-25	NP-10
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
21A, 21B, 21C, 21D, 21E-------- Penn	0-9	Silt loam--------	ML	A-4	0-5	95-100	80-100	85-95	60-85	---	---
	9-21	Channery silt loam, channery loam, channery silty clay loam, silt loam.	ML, SM, GM	A-4, A-2	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	21-36	Very channery silt loam, very channery loam, extremely channery silt loam.	ML, CL, SM, GM	A-4, A-2, A-1	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
21F*: Nestoria--------	0-2	Very gravelly silt loam.	SM, SC-SM, SC	A-2, A-4	5-10	85-95	40-50	35-45	25-40	<30	NP-10
	2-18	Very gravelly loam, very gravelly silt loam, extremely gravelly silt loam.	GW-GC, SW-SC, SC-SM	A-1, A-2, A-4, A-6	5-10	35-75	15-50	14-45	10-40	15-30	6-15
	18-36	Weathered bedrock	---	---	---	---	---	---	---	---	---
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
22A, 22B--------- Readington	0-6	Silt loam--------	ML	A-4	0-5	90-100	80-100	80-100	65-100	---	NP
	6-20	Loam, channery silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0-10	80-100	70-100	65-100	55-95	25-39	5-12
	20-44	Silt loam, channery loam, channery silt loam, silty clay loam.	ML, CL, SM, GM	A-2, A-4, A-6	0-10	60-95	40-90	30-85	25-55	20-35	NP-12
	44	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
23A-------------- Croton	0-12	Silt loam--------	CL, CL-ML	A-4, A-6	0-1	90-100	90-100	85-95	75-90	25-40	5-15
	12-17	Silt loam, silty clay loam, channery silt loam.	CL	A-6	0-10	90-100	85-95	80-90	70-85	30-40	10-15
	17-32	Silt loam, silty clay loam, channery silt loam.	CL	A-6	0-10	90-100	85-95	80-90	70-85	30-40	10-15
	32-56	Channery silt loam, channery silty clay loam, channery clay loam.	CL	A-6	0-10	75-95	65-80	60-75	50-70	30-40	10-15
	56	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
24C, 24D--------- Montalto	0-15	Very stony silt loam.	ML	A-4, A-6	5-10	95-100	80-100	70-100	50-95	32-40	7-12
	15-42	Clay, silty clay, clay loam.	CL, CH	A-7	0-5	95-100	80-100	70-100	60-95	40-54	18-27
	42-72	Loam, clay loam, silty clay loam.	ML, CL, CH, MH	A-6, A-7	0-10	90-100	80-100	70-100	50-95	38-52	13-25
25B, 25C--------- Legore	0-8	Silt loam--------	CL	A-4, A-6	0-5	85-100	80-100	70-100	50-95	<40	7-15
	8-28	Gravelly silty clay loam, clay loam, silty clay loam.	ML, MH, SM	A-7	0-15	80-100	50-100	50-100	40-95	40-65	14-30
	28-60	Gravelly silt loam, silty clay loam, sandy loam, gravelly loam.	SM, GM, ML	A-2, A-4, A-5, A-7	0-15	60-100	50-100	45-100	25-95	<50	NP-15
26B, 26C--------- Montalto	0-15	Silt loam--------	ML, CL, CH	A-6, A-7	0-5	95-100	80-100	70-100	50-95	36-52	10-25
	15-42	Clay, silty clay, clay loam, silty clay loam.	CL, CH	A-7	0-5	95-100	80-100	70-100	60-95	40-54	18-27
	42-72	Loam, clay loam, silty clay loam, silt loam.	ML, CL, CH	A-6, A-7	0-10	90-100	80-100	70-100	50-95	38-52	13-25
27B, 27C--------- Neshaminy	0-8	Silt loam--------	ML, CL	A-4, A-6	0-10	95-100	90-100	80-100	65-85	---	---
	8-48	Silt loam, gravelly silty clay loam, gravelly sandy clay loam, silty clay loam, clay loam.	ML, SM, MH, GM	A-4, A-7, A-2, A-6	0-40	60-100	55-100	45-100	30-75	25-55	NP-22
	48	Weathered bedrock	---	---	---	---	---	---	---	---	---
28A-------------- Watchung	0-9	Silt loam, silty clay loam.	ML	A-4, A-6, A-7	0-15	85-100	80-100	70-100	50-95	35-45	8-14
	9-33	Clay, silty clay, silty clay loam.	CL, CH	A-7	0-15	85-100	80-100	70-100	60-95	40-65	15-35
	33-65	Silt loam, silty clay loam, loam, clay loam.	ML	A-6, A-7	0-15	85-100	80-100	70-100	50-95	35-45	10-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
29B-------------- Jackland	0-10	Silt loam--------	CL	A-6	1-5	95-100	80-100	75-95	51-70	25-40	10-20
	10-32	Clay-------------	CL	A-7	0	99-100	80-100	70-100	55-95	50-75	35-50
	32-69	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC, SC-SM	A-4, A-6	1-5	95-100	65-95	45-90	40-85	20-40	5-20
35B*:											
Chrome----------	0-10	Silt loam--------	ML, CL-ML	A-4, A-6, A-7	0-5	90-100	90-100	80-95	70-95	25-45	4-15
	10-23	Clay loam, gravelly silty clay, gravelly clay loam, silty clay loam, gravelly silty clay loam.	ML, CL, MH, CH	A-4, A-6, A-7	0-10	65-100	60-80	55-75	50-70	35-60	20-45
	23	Weathered bedrock	---	---	---	---	---	---	---	---	---
Conowingo-------	0-9	Silt loam--------	CL	A-6, A-7	0	85-100	80-100	70-100	55-95	30-45	12-20
	9-27	Silty clay loam, clay loam.	ML, CL, MH, CH	A-6, A-7	0	85-100	80-100	75-100	55-90	35-60	15-28
	27-32	Silty clay loam, silt loam.	ML, CL, MH, CH	A-6, A-7	0	85-100	80-100	70-100	55-95	35-55	15-25
	32-60	Gravelly silt loam, silty clay loam, clay loam.	GM, ML, SM	A-4, A-6	0-10	60-100	50-100	45-100	35-90	<40	8-14
35C-------------- Chrome	0-10	Silt loam--------	ML, CL-ML	A-4, A-6, A-7	0-5	90-100	90-100	80-95	70-95	25-45	4-15
	10-23	Clay loam, gravelly silty clay, gravelly clay loam.	ML, CL, MH, CH	A-4, A-6, A-7	0-10	65-100	60-80	55-75	50-70	35-60	20-45
	23	Weathered bedrock	---	---	---	---	---	---	---	---	---
36A-------------- Conowingo	0-9	Silt loam--------	CL	A-6, A-7	0	85-100	80-100	70-100	55-95	30-45	12-20
	9-27	Silty clay loam, clay loam, gravelly silty clay loam.	ML, CL, MH, CH	A-6, A-7	0	85-100	80-100	75-100	55-90	35-60	15-28
	27-32	Silty clay loam, silt loam, gravelly silty clay loam.	ML, CL, MH, CH	A-6, A-7	0	85-100	80-100	70-100	55-95	35-55	15-25
	32-60	Gravelly silt loam, silty clay loam, clay loam.	GM, ML, SM	A-4, A-6	0-10	60-100	50-100	45-100	35-90	<40	8-14
37B-------------- Travilah	0-10	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	90-100	85-100	80-95	65-80	25-35	5-15
	10-33	Silt loam, silty clay loam, channery silty clay loam.	CL, GC, SC	A-6	0-5	60-100	55-100	50-95	40-85	30-40	10-20
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
41A, 41B--------- Elsinboro	0-9	Silt loam--------	CL, SC	A-2, A-4	0-5	85-100	80-100	50-100	25-90	21-28	4-9
	9-60	Silty clay loam, silt loam, loam.	CL	A-6	0-5	85-100	80-100	70-100	50-95	28-40	11-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
43A-------------- Elk	0-9	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
	9-54	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
	54-66	Silty clay loam, silt loam, silty clay.	ML, CL, CL-ML, SC-SM	A-4, A-6	0	75-100	50-100	45-100	40-95	25-40	5-15
45A-------------- Delanco	0-8	Silt loam--------	ML, CL, SM, SC	A-4, A-6	0	90-100	80-100	55-100	30-90	<30	NP-15
	8-48	Silty clay loam, silt loam, clay loam, loam.	CL, ML	A-6, A-7	0	90-100	80-100	70-100	50-95	35-50	10-20
	48-60	Clay loam, silt loam, gravelly sandy loam, sandy loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	65-100	50-100	30-100	15-90	<35	NP-15
46A-------------- Huntington	0-12	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	60-95	25-40	5-15
	12-65	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	60-95	25-40	5-15
47A-------------- Lindside	0-9	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	80-100	55-90	20-35	2-15
	9-65	Silty clay loam, silt loam, very fine sandy loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	100	95-100	90-100	70-95	25-40	4-18
48A-------------- Melvin	0-9	Silt loam--------	CL, CL-ML, ML	A-4	0	95-100	90-100	80-100	80-95	25-35	4-10
	9-46	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	80-98	25-40	5-20
	46-60	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	70-100	60-98	25-40	5-20
50A-------------- Rowland	0-11	Silt loam--------	ML, SM	A-4	0-5	95-100	95-100	75-100	35-95	---	---
	11-34	Silt loam, loam, sandy clay loam.	ML, SM	A-4, A-7, A-6	0-5	95-100	95-100	75-100	35-95	24-45	NP-15
	34-54	Sandy clay, silt loam, gravelly silty clay loam.	ML, SM	A-4, A-6, A-7	0-10	90-100	70-100	65-100	35-95	25-50	3-17
	54-66	Stratified sand to gravel.	SM, GM, GC, SC	A-2, A-1	0-15	55-80	30-70	20-40	15-30	---	---
51A*:											
Bowmansville----	0-11	Silt loam--------	ML, SM	A-4	0-5	95-100	80-100	60-100	35-90	---	NP
	11-48	Silt loam, silty clay loam, sandy clay loam.	ML, CL, SM, SC	A-4, A-6, A-7	0-5	95-100	80-100	80-100	40-90	30-45	8-15
	48-62	Silty clay loam, sandy loam, gravelly silt loam.	ML, CL, SM, MH	A-6, A-7	0-10	90-100	65-100	60-100	35-100	35-55	15-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
51A*:											
Melvin----------	0-9	Silt loam--------	CL, CL-ML, ML	A-4	0	95-100	90-100	80-100	80-95	25-35	4-10
	9-46	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	80-98	25-40	5-20
	46-60	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	70-100	60-98	25-40	5-20
53A-------------- Codorus	0-11	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	80-100	70-100	65-100	55-95	22-35	2-12
	11-40	Silt loam, loam, silty clay loam, gravelly silt loam.	ML, CL, CL-ML	A-4, A-6	0	80-100	75-100	65-100	55-85	22-35	2-12
	40-60	Stratified sand to silt.	SM, GM, ML	A-1, A-2, A-4	0	25-100	20-100	20-85	15-65	<35	NP-7
54A-------------- Hatboro	0-11	Silt loam--------	ML, CL, SC, SM	A-4, A-6	0	95-100	90-100	70-100	40-90	22-35	2-12
	11-55	Silt loam, silty clay loam, sandy clay loam.	ML, CL, CL-ML	A-4, A-6	0	85-100	80-100	70-95	55-85	22-35	2-12
	55-60	Sandy clay loam, sandy loam, silt loam, fine sandy loam.	ML, CL, SC, SM	A-4	0	75-100	70-100	60-90	45-60	22-30	2-10
55C-------------- Evesboro	0-11	Loamy sand-------	SP, SP-SM	A-1, A-3, A-2	0	90-100	85-100	40-90	0-12	10-15	NP-3
	11-60	Sand, loamy sand	SP, SP-SM	A-1, A-3, A-2	0	90-100	85-100	40-90	0-12	10-15	NP-3
57B, 57C, 57D---- Chillum	0-13	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-100	60-90	20-30	2-10
	13-28	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	90-100	70-95	26-44	6-20
	28-60	Very gravelly sandy loam, gravelly sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	25-90	15-75	10-50	5-30	---	NP
57UB*:											
Chillum---------	0-13	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-100	60-90	20-30	2-10
	13-28	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	90-100	70-95	26-44	6-20
	28-60	Very gravelly sandy loam, gravelly sandy loam.	GM, SM, GP-GM, SP-SM	A-1, A-2	0	25-90	15-75	10-50	5-30	---	NP
Urban land.											
58B, 58C--------- Sassafras	0-8	Loam-------------	ML, CL, CL-ML	A-4	0	85-100	80-100	70-95	50-75	12-32	NP-10
	8-35	Loam, sandy clay loam, sandy loam.	SC-SM, CL, SC, CL-ML	A-2, A-4, A-6	0	85-100	80-100	50-95	25-75	20-33	5-15
	35-65	Stratified sand to gravelly sandy loam.	SP-SM, SC, SM, SC-SM	A-1, A-2, A-4, A-3	0	70-100	50-100	30-90	5-55	<26	NP-8

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
59A, 59B--------- Beltsville	0-13	Silt loam--------	ML, CL-ML	A-4	0	85-100	80-100	70-100	50-90	22-26	3-7
	13-31	Silty clay loam, silt loam.	CL	A-4, A-6	0	85-100	80-100	70-100	55-95	29-32	9-12
	31-42	Silty clay loam, silt loam, loam.	CL	A-6, A-4	0	85-100	80-100	70-100	50-95	29-34	9-14
	42-60	Gravelly sandy loam, sandy loam, clay loam.	SM, ML, CL, GM	A-2, A-4, A-6, A-1-b	0	60-100	50-100	30-100	15-90	18-34	3-16
61B, 61C, 61D, 61E------------- Croom	0-14	Gravelly loam----	SM, ML, CL, GM	A-1, A-2, A-4, A-6	0	60-85	50-75	30-70	15-55	15-33	2-16
	14-28	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GP-GM, GP-GC, GC, GM	A-1, A-2-4, A-2-6	0	40-80	30-55	20-50	10-30	8-36	2-16
	28-65	Very gravelly loamy sand, very gravelly sandy loam, very gravelly sandy clay loam.	GW, GM, GC, GP	A-1, A-2-4, A-2-6	0	40-80	30-55	15-50	2-30	<36	NP-16
61UB*: Croom-----------	0-14	Gravelly loam----	SM, ML, CL, GM	A-1, A-2, A-4, A-6	0	60-85	50-75	30-70	15-55	15-33	2-16
	14-28	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GP-GM, GP-GC, GC, GM	A-1, A-2-4, A-2-6	0	40-80	30-55	20-50	10-30	8-36	2-16
	28-65	Very gravelly loamy sand, very gravelly sandy loam, very gravelly sandy clay loam.	GW, GM, GC, GP	A-1, A-2-4, A-2-6	0	40-80	30-55	15-50	2-30	<36	NP-16
Urban land.											
64B*, 64C*: Croom-----------	0-14	Gravelly loam----	SM, ML, CL, GM	A-1, A-2, A-4, A-6	0	60-85	50-75	30-70	15-55	15-33	2-16
	14-28	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GP-GM, GP-GC, GC, GM	A-1, A-2-4, A-2-6	0	40-80	30-55	20-50	10-30	8-36	2-16
	28-65	Very gravelly loamy sand, very gravelly sandy loam, very gravelly sandy clay loam.	GW, GM, GC, GP	A-1, A-2-4, A-2-6	0	40-80	30-55	15-50	2-30	<36	NP-16

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
64B*, 64C*:											
Bucks	0-12	Silt loam	ML, CL-ML, CL	A-4	0	95-100	95-100	85-95	65-90	20-35	3-10
	12-33	Silt loam, silty clay loam, channery loam.	ML, CL	A-4, A-6	0-3	75-100	60-80	55-75	50-70	30-40	5-15
	33-45	Channery silt loam, silt loam, silty clay loam.	ML, CL, SC, SM	A-4, A-6	5-15	65-90	55-85	50-80	45-75	20-40	3-15
	45	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
65B Wheaton	0-6	Silt loam	CL, CL-ML	A-4, A-6	0-5	80-100	75-100	65-90	55-80	25-35	5-15
	6-68	Loam, silt loam, channery loam.	CL, CL-ML, GC, GM-GC	A-4, A-6	0-5	65-100	55-95	45-85	35-65	25-35	5-15
66UB*, 66UC*:											
Wheaton	0-6	Silt loam	CL, CL-ML	A-4, A-6	0-5	80-100	75-100	65-90	55-80	25-35	5-15
	6-68	Loam, silt loam, channery loam.	CL, CL-ML, GC, GM-GC	A-4, A-6	0-5	65-100	55-95	45-85	35-65	25-35	5-15
Urban land.											
67UB*:											
Urban land.											
Wheaton	0-6	Silt loam	CL, CL-ML	A-4, A-6	0-5	80-100	75-100	65-90	55-80	25-35	5-15
	6-68	Loam, silt loam, channery loam.	CL, CL-ML, GC, GM-GC	A-4, A-6	0-5	65-100	55-95	45-85	35-65	25-35	5-15
100*. Dumps, refuse											
109D, 109E Hyattstown	0-9	Channery silt loam.	CL, CL-ML, GC, GM-GC	A-4, A-6, A-2-4	0-5	55-80	50-75	40-75	30-70	20-30	5-15
	9-14	Very channery silt loam, very channery clay loam.	GC, GM, SM, SC	A-2, A-6, A-7	0-5	40-85	30-55	25-55	20-50	30-50	10-20
	14-18	Extremely channery silt loam, very channery silt loam, extremely channery clay loam.	GC, SC, GM-GC	A-2, A-4, A-6, A-1	5-10	25-85	10-55	10-55	7-45	20-30	5-15
	18-26	Weathered bedrock	---	---	---	---	---	---	---	---	---
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
116C, 116D, 116E Blocktown	0-6	Channery silt loam.	CL-ML, CL, GM-GC, GC	A-2, A-4, A-6	0-10	65-85	55-75	45-70	30-65	15-30	5-15
	6-17	Very channery loam, very channery silty clay loam, extremely channery silt loam.	GC, GM	A-2, A-6, A-7	5-10	30-60	25-55	20-50	15-45	30-50	10-20
	17-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
200*. Pits, gravel											
201*. Pits, quarry											
300*: Rock outcrop.											
Blocktown-------	0-6	Channery silt loam.	CL-ML, CL, GM-GC, GC	A-2, A-4, A-6	0-10	65-85	55-75	45-70	30-65	15-30	5-15
	6-17	Very channery loam, very channery silty clay loam, extremely channery silt loam.	GC, GM	A-2, A-6, A-7	5-10	30-60	25-55	20-50	15-45	30-50	10-20
	17-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
400*. Urban land											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
1B, 1C-----------	0-8	10-25	1.20-1.40	0.6-2.0	0.14-0.20	3.6-5.5	Low-----------	0.37	5	.5-2
Gaila	8-17	18-30	1.30-1.50	0.6-2.0	0.10-0.18	3.6-5.5	Low-----------	0.32		
	17-20	10-25	1.25-1.50	2.0-6.0	0.10-0.16	3.6-5.5	Low-----------	0.28		
	20-76	5-20	1.25-1.50	2.0-6.0	0.08-0.14	3.6-5.5	Low-----------	0.24		
2A, 2B, 2C-------	0-8	15-25	1.10-1.40	0.6-2.0	0.14-0.24	4.5-5.5	Low-----------	0.32	5	1-3
Glenelg	8-28	20-32	1.20-1.60	0.6-2.0	0.14-0.20	4.5-6.5	Low-----------	0.43		
	28-60	5-20	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.5	Low-----------	0.49		
2UB*, 2UC*:										
Glenelg---------	0-8	15-25	1.10-1.40	0.6-2.0	0.14-0.24	4.5-5.5	Low-----------	0.32	5	1-3
	8-28	20-32	1.20-1.60	0.6-2.0	0.14-0.20	4.5-6.5	Low-----------	0.43		
	28-60	5-20	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.5	Low-----------	0.49		
Urban land.										
4B, 4C-----------	0-15	15-27	1.25-1.40	0.6-2.0	0.12-0.24	4.5-6.0	Low-----------	0.32	5	1-3
Elioak	15-42	30-60	1.30-1.60	0.2-2.0	0.08-0.12	4.5-5.5	Low-----------	0.37		
	42-60	15-27	1.25-1.40	0.6-2.0	0.08-0.12	4.5-6.0	Low-----------	0.49		
5A, 5B-----------	0-8	10-20	1.20-1.40	0.6-2.0	0.16-0.20	4.5-7.3	Low-----------	0.32	3	2-4
Glenville	8-30	20-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low-----------	0.24		
	30-40	20-35	1.60-1.80	0.06-0.6	0.08-0.12	4.5-6.0	Low-----------	0.24		
	40-70	5-25	1.40-1.60	0.2-0.6	0.06-0.12	4.5-5.5	Low-----------	0.24		
6A---------------	0-8	15-32	1.20-1.40	0.2-0.6	0.16-0.25	3.6-5.5	Low-----------	0.43	5	1-4
Baile	8-31	10-35	1.30-1.60	0.06-0.2	0.12-0.24	3.6-5.5	Moderate-----	0.43		
	31-62	10-25	1.30-1.60	0.06-0.6	0.10-0.24	3.6-5.5	Low-----------	0.43		
7UB*, 7UC*:										
Gaila-----------	0-8	10-25	1.20-1.40	0.6-2.0	0.14-0.20	3.6-5.5	Low-----------	0.37	5	.5-2
	8-17	18-30	1.30-1.50	0.6-2.0	0.10-0.18	3.6-5.5	Low-----------	0.32		
	17-20	10-25	1.25-1.50	2.0-6.0	0.10-0.16	3.6-5.5	Low-----------	0.28		
	20-76	5-20	1.25-1.50	2.0-6.0	0.08-0.14	3.6-5.5	Low-----------	0.24		
Urban land.										
9B*, 9C*:										
Linganore-------	0-11	18-26	0.80-1.00	0.6-2.0	0.10-0.17	5.1-6.5	Moderate-----	0.24	5	.5-1
	11-17	20-35	1.25-1.55	0.2-0.6	0.09-0.14	5.1-6.5	Low-----------	0.17		
	17-22	18-32	1.25-1.55	0.2-0.6	0.05-0.09	5.1-6.5	Low-----------	0.05		
	22-51	---	---	0.01-0.06	---	---	-------------	----		
	51	---	---	0.00-0.01	---	---	-------------	----		
Hyattstown------	0-9	15-25	1.40-1.60	0.6-2.0	0.17-0.19	5.6-7.3	Low-----------	0.24	1	.5-2
	9-14	18-35	1.40-1.60	0.6-2.0	0.10-0.13	5.6-7.3	Low-----------	0.17		
	14-18	10-25	1.40-1.60	0.6-2.0	0.04-0.09	5.6-7.3	Low-----------	0.10		
	18-26	---	---	0.01-0.06	---	---	-------------	----		
	26	---	---	0.00-0.01	---	---	-------------	----		
16B*, 16C*, 16D*:										
Brinklow--------	0-10	10-25	1.20-1.40	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.28	3	1-3
	10-25	18-35	1.20-1.60	0.2-0.6	0.12-0.21	4.5-6.0	Moderate-----	0.24		
	25-35	---	---	0.01-0.06	---	---	-------------	----		
	35	---	---	0.00-0.01	---	---	-------------	----		

See footnote at end of table.

TABLE 16.--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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
16B*, 16C*, 16D*:										
Blocktown-------	0-6	15-25	1.40-1.60	0.6-2.0	0.10-0.16	5.6-7.3	Low----------	0.24	1	.5-2
	6-17	18-35	1.35-1.55	0.6-2.0	0.04-0.10	5.6-6.5	Low----------	0.10		
	17-21	---	---	0.01-0.06	---	---	-------------	----		
	21	---	---	0.00-0.01	---	---	-------------	----		
17B, 17C--------- Occoquan	0-8	7-27	1.10-1.40	0.6-2.0	0.18-0.22	3.6-5.5	Low----------	0.37	3	1-3
	8-15	18-35	1.30-1.60	0.6-6.0	0.10-0.14	3.6-5.5	Low----------	0.32		
	15-59	5-27	1.20-1.50	2.0-6.0	0.07-0.10	3.6-5.5	Low----------	0.24		
	59	---	---	0.0-0.06	---	---	-------------	----		
18C, 18E--------- Penn	0-9	10-20	1.20-1.40	0.6-6.0	0.14-0.20	3.6-5.5	Low----------	0.24	3	2-4
	9-21	18-25	1.40-1.60	0.6-6.0	0.14-0.18	3.6-6.0	Low----------	0.24		
	21-36	18-25	1.40-1.60	0.6-6.0	0.04-0.08	5.1-6.5	Low----------	0.24		
	36	---	---	0.2-6.0	---	---	-------------	----		
19A, 19B--------- Bucks	0-12	10-25	1.20-1.60	0.2-2.0	0.16-0.22	4.5-5.5	Low----------	0.37	4	2-4
	12-33	20-30	1.35-1.60	0.2-2.0	0.12-0.18	4.5-5.5	Moderate-----	0.43		
	33-45	10-30	1.40-1.60	0.2-2.0	0.09-0.16	4.5-5.5	Low----------	0.43		
	45	---	---	0.00-0.2	---	---	-------------	----		
20A, 20B, 20C---- Brentsville	0-10	5-15	1.40-1.60	0.6-2.0	0.10-0.14	3.6-5.5	Low----------	0.28	2	.5-2
	10-33	10-18	1.40-1.60	0.6-2.0	0.10-0.18	3.6-5.5	Low----------	0.15		
	33	---	---	0.0-0.2	---	---	-------------	----		
21A, 21B, 21C, 21D, 21E-------- Penn	0-9	10-20	1.20-1.40	0.6-6.0	0.16-0.20	3.6-5.5	Low----------	0.32	3	1-3
	9-21	18-32	1.40-1.60	0.6-6.0	0.14-0.18	3.6-6.0	Low----------	0.24		
	21-36	18-25	1.40-1.60	0.6-6.0	0.04-0.08	5.1-6.5	Low----------	0.24		
	36	---	---	0.2-6.0	---	---	-------------	----		
21F*:										
Nestoria--------	0-2	10-27	1.40-1.60	0.6-2.0	0.08-0.10	4.5-6.0	Low----------	0.17	1	.5-2
	2-18	15-27	1.35-1.55	0.6-2.0	0.04-0.10	4.5-6.0	Low----------	0.10		
	18-36	---	---	0.0-0.2	---	---	-------------	----		
	36	---	---	0.0-0.06	---	---	-------------	----		
Rock outcrop.										
22A, 22B--------- Readington	0-6	15-20	1.20-1.40	0.6-2.0	0.18-0.23	3.6-6.5	Low----------	0.43	3	1-3
	6-20	18-35	1.40-1.60	0.6-2.0	0.08-0.14	3.6-6.5	Low----------	0.32		
	20-44	20-30	1.60-1.80	0.2-0.6	0.06-0.10	5.1-6.5	Low----------	0.32		
	44	---	---	0.2-2.0	---	---	-------------	----		
23A-------------- Croton	0-12	15-30	1.28-1.42	0.2-2.0	0.15-0.22	4.5-5.5	Low----------	0.43	3	3-5
	12-17	20-35	1.38-1.55	0.2-0.6	0.12-0.20	4.5-6.0	Moderate-----	0.43		
	17-32	20-30	1.65-1.80	0.06-0.2	0.06-0.10	4.5-6.0	Low----------	0.43		
	32-56	20-30	1.60-1.80	0.06-0.2	0.08-0.12	4.5-6.0	Low----------	0.37		
	56	---	---	0.00-0.2	---	---	-------------	----		
24C, 24D--------- Montalto	0-15	18-27	1.40-1.70	0.6-6.0	0.12-0.16	4.5-6.5	Low----------	0.32	5	1-3
	15-42	30-55	1.60-1.90	0.2-0.6	0.14-0.21	5.1-6.5	High---------	0.28		
	42-72	20-40	1.60-1.80	0.6-2.0	0.14-0.21	5.1-6.5	Moderate-----	0.28		
25B, 25C--------- Legore	0-8	12-34	1.20-1.40	0.6-6.0	0.12-0.24	5.1-6.0	Low----------	0.32	5	1-3
	8-28	27-34	1.40-1.60	0.6-2.0	0.12-0.24	5.6-6.5	Moderate-----	0.17		
	28-60	18-34	1.40-1.60	0.6-6.0	0.08-0.12	5.6-6.5	Low----------	0.28		
26B, 26C--------- Montalto	0-15	18-35	1.40-1.70	0.6-6.0	0.12-0.16	4.5-6.5	Low----------	0.32	5	1-3
	15-42	30-55	1.60-1.90	0.2-0.6	0.14-0.16	5.1-6.5	High---------	0.28		
	42-72	20-40	1.60-1.80	0.6-2.0	0.14-0.21	5.1-6.5	Moderate-----	0.28		

See footnote at end of table.

TABLE 16.--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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
27B, 27C---------- Neshaminy	0-8	10-25	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low-----------	0.32	4	2-4
	8-48	20-40	1.40-1.60	0.2-0.6	0.10-0.14	5.1-6.5	Low-----------	0.17		
	48	---	---	0.2-2.0	---	---	-------------	----		
28A-------------- Watchung	0-9	15-40	1.20-1.40	0.2-2.0	0.14-0.21	4.5-6.5	Low-----------	0.43	5	1-3
	9-33	40-65	1.20-1.50	<0.2	0.10-0.21	5.1-7.3	Moderate------	0.37		
	33-65	15-40	1.20-1.50	0.2-2.0	0.12-0.21	5.6-7.3	Moderate------	0.37		
29B-------------- Jackland	0-10	15-27	1.00-1.30	0.6-2.0	0.16-0.22	4.5-6.0	Low-----------	0.32	3	.5-2
	10-32	40-60	1.20-1.50	<0.06	0.08-0.12	4.5-7.8	Very high-----	0.10		
	32-69	10-40	1.30-1.60	0.6-2.0	0.10-0.14	4.5-7.8	Low-----------	0.15		
35B*:										
Chrome-----------	0-10	15-35	1.20-1.40	0.6-2.0	0.14-0.18	6.1-7.3	Low-----------	0.32	2	1-3
	10-23	28-45	1.40-1.60	0.6-2.0	0.12-0.16	6.1-7.3	Moderate------	0.17		
	23	---	---	0.06-2.0	---	---	-------------	----		
Conowingo--------	0-9	18-30	1.10-1.30	0.2-2.0	0.19-0.21	5.1-6.0	Low-----------	0.43	3-2	1-3
	9-27	25-35	1.30-1.55	0.06-0.2	0.15-0.19	5.1-6.5	Moderate------	0.43		
	27-32	22-35	1.30-1.55	0.06-0.2	0.15-0.19	5.1-7.3	Moderate------	0.43		
	32-60	18-30	1.30-1.50	0.2-2.0	0.12-0.18	5.6-7.8	Low-----------	0.37		
35C-------------- Chrome	0-10	15-35	1.20-1.40	0.6-2.0	0.14-0.18	6.1-7.3	Low-----------	0.32	2	1-3
	10-23	28-45	1.40-1.60	0.6-2.0	0.12-0.16	6.1-7.3	Moderate------	0.17		
	23	---	---	0.06-2.0	---	---	-------------	----		
36A-------------- Conowingo	0-9	18-30	1.10-1.30	0.2-2.0	0.19-0.21	5.1-6.0	Low-----------	0.43	3-2	1-3
	9-27	25-35	1.30-1.55	0.06-0.2	0.15-0.19	5.1-6.5	Moderate------	0.43		
	27-32	22-35	1.30-1.55	0.06-0.2	0.15-0.19	5.1-7.3	Moderate------	0.43		
	32-60	18-30	1.30-1.50	0.2-2.0	0.12-0.18	5.6-7.8	Low-----------	0.37		
37B-------------- Travilah	0-10	15-25	1.20-1.40	0.6-2.0	0.17-0.21	5.6-7.8	Moderate------	0.43	2	.5-1
	10-33	20-35	1.40-1.60	0.2-0.6	0.14-0.21	5.6-7.8	Moderate------	0.43		
	33	---	---	0.00-0.01	---	---	-------------	----		
41A, 41B--------- Elsinboro	0-9	8-18	1.25-1.40	0.6-2.0	0.10-0.18	4.5-5.5	Low-----------	0.37	4	1-3
	9-60	18-34	1.30-1.50	0.6-2.0	0.12-0.16	4.5-5.5	Low-----------	0.28		
43A-------------- Elk	0-9	10-27	1.20-1.40	0.6-2.0	0.19-0.23	4.5-6.5	Low-----------	0.37	5	.5-3
	9-54	18-34	1.20-1.50	0.6-2.0	0.18-0.22	4.5-6.5	Low-----------	0.28		
	54-66	15-40	1.20-1.50	0.6-2.0	0.14-0.20	4.5-6.5	Low-----------	0.28		
45A-------------- Delanco	0-8	5-20	1.10-1.30	0.6-2.0	0.14-0.24	3.6-5.5	Low-----------	0.37	5	2-4
	8-48	18-30	1.40-1.60	0.2-0.6	0.18-0.22	3.6-5.5	Moderate------	0.32		
	48-60	5-25	1.50-1.70	0.6-2.0	0.10-0.22	3.6-5.5	Low-----------	0.28		
46A-------------- Huntington	0-12	18-30	1.10-1.30	0.6-2.0	0.18-0.24	5.6-7.8	Low-----------	0.28	5	3-6
	12-65	18-30	1.30-1.50	0.6-2.0	0.16-0.22	5.6-7.8	Low-----------	0.32		
47A-------------- Lindside	0-9	15-27	1.20-1.40	0.6-2.0	0.20-0.26	5.1-7.8	Low-----------	0.32	5	2-4
	9-65	18-35	1.20-1.40	0.2-2.0	0.17-0.22	5.1-7.8	Low-----------	0.37		
48A-------------- Melvin	0-9	12-17	1.20-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low-----------	0.43	5	.5-3
	9-46	12-35	1.30-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low-----------	0.43		
	46-60	7-40	1.40-1.70	0.6-2.0	0.16-0.23	5.6-7.8	Low-----------	0.43		
50A-------------- Rowland	0-11	10-20	1.10-1.30	0.2-2.0	0.14-0.18	4.5-6.0	Low-----------	0.43	4	2-4
	11-34	15-32	1.20-1.50	0.2-2.0	0.14-0.18	4.5-6.0	Low-----------	0.28		
	34-54	15-32	1.20-1.50	0.2-2.0	0.12-0.16	4.5-6.0	Low-----------	0.28		
	54-66	3-12	1.40-1.70	2.0-6.0	0.03-0.08	4.5-6.0	Low-----------	0.17		

See footnote at end of table.

TABLE 16.--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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
51A*:										
Bowmansville	0-11	10-17	1.20-1.40	0.6-2.0	0.16-0.20	5.1-6.5	Low	0.32	4	2-4
	11-48	15-30	1.30-1.50	0.2-0.6	0.16-0.20	5.1-6.5	Low	0.28		
	48-62	15-30	1.20-1.50	0.2-2.0	0.12-0.18	5.1-7.3	Low	0.28		
Melvin	0-9	12-17	1.20-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43	5	.5-3
	9-46	12-35	1.30-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43		
	46-60	7-40	1.40-1.70	0.6-2.0	0.16-0.23	5.6-7.8	Low	0.43		
53A Codorus	0-11	15-25	1.20-1.40	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.49	4	2-4
	11-40	18-35	1.20-1.50	0.6-2.0	0.14-0.18	5.1-6.5	Low	0.37		
	40-60	5-12	1.20-1.50	2.0-20	0.04-0.08	5.1-6.5	Low	0.24		
54A Hatboro	0-11	10-20	1.20-1.40	0.6-2.0	0.16-0.22	4.5-7.3	Low	0.49	4	1-4
	11-55	15-35	1.20-1.40	0.6-2.0	0.16-0.20	4.5-7.3	Low	0.32		
	55-60	10-35	1.20-1.50	0.6-2.0	0.10-0.14	5.6-6.5	Low	0.20		
55C Evesboro	0-11	1-4	1.20-1.55	6.0-20	0.04-0.09	3.6-5.0	Low	0.17	4	<1
	11-60	3-6	1.30-1.60	6.0-20	0.04-0.09	3.6-5.0	Low	0.17		
57B, 57C, 57D Chillum	0-13	10-23	1.10-1.30	0.6-2.0	0.19-0.21	4.5-5.5	Low	0.43	5	1-3
	13-28	18-35	1.10-1.30	0.6-2.0	0.19-0.22	4.5-5.5	Low	0.37		
	28-60	18-23	1.20-1.50	0.2-2.0	0.03-0.12	4.5-5.5	Low	0.17		
57UB*:										
Chillum	0-13	10-23	1.10-1.30	0.6-2.0	0.19-0.21	4.5-5.5	Low	0.43	5	1-3
	13-28	18-35	1.10-1.30	0.6-2.0	0.19-0.22	4.5-5.5	Low	0.37		
	28-60	18-23	1.20-1.50	0.2-2.0	0.03-0.12	4.5-5.5	Low	0.17		
Urban land.										
58B, 58C Sassafras	0-8	3-12	1.00-1.45	0.6-2.0	0.12-0.20	3.6-5.5	Low	0.28	5	1-2
	8-35	18-27	1.40-1.65	0.2-2.0	0.11-0.22	3.6-5.5	Low	0.37		
	35-65	3-16	1.40-1.70	0.6-20	0.04-0.12	3.6-5.5	Low	0.17		
59A, 59B Beltsville	0-13	7-20	1.20-1.40	0.6-2.0	0.18-0.21	3.6-5.5	Low	0.43	3	1-3
	13-31	20-30	1.30-1.50	0.6-2.0	0.18-0.21	3.6-5.5	Low	0.43		
	31-42	20-30	1.60-1.90	<0.2	0.05-0.10	3.6-5.5	Low	0.32		
	42-60	20-35	1.30-1.50	0.2-6.0	0.08-0.18	3.6-5.5	Low	0.37		
61B, 61C, 61D, 61E Croom	0-14	10-23	1.20-1.40	0.6-2.0	0.10-0.18	4.5-6.0	Low	0.43	4	1-3
	14-28	10-35	1.30-1.50	0.2-2.0	0.05-0.10	4.5-6.0	Low	0.17		
	28-65	5-30	1.30-1.50	0.6-20	0.04-0.07	4.5-6.0	Low	0.17		
61UB*:										
Croom	0-14	10-23	1.20-1.40	0.6-2.0	0.10-0.18	4.5-6.0	Low	0.43	4	1-3
	14-28	10-35	1.30-1.50	0.2-2.0	0.05-0.10	4.5-6.0	Low	0.17		
	28-65	5-30	1.30-1.50	0.6-20	0.04-0.07	4.5-6.0	Low	0.17		
Urban land.										
64B*, 64C*:										
Croom	0-14	10-23	1.20-1.40	0.6-2.0	0.10-0.18	4.5-6.0	Low	0.43	4	1-3
	14-28	10-35	1.30-1.50	0.2-2.0	0.05-0.10	4.5-6.0	Low	0.17		
	28-65	5-30	1.30-1.50	0.6-20	0.04-0.07	4.5-6.0	Low	0.17		
Bucks	0-12	10-25	1.20-1.60	0.2-2.0	0.16-0.22	4.5-5.5	Low	0.37	4	2-4
	12-33	20-30	1.35-1.60	0.2-2.0	0.12-0.18	4.5-5.5	Moderate	0.43		
	33-45	10-30	1.40-1.60	0.2-2.0	0.09-0.16	4.5-5.5	Low	0.43		
	45	---	---	0.00-0.2	---	---	---	----		

See footnote at end of table.

TABLE 16.--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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
65B--------------	0-6	18-27	1.45-1.65	0.6-2.0	0.13-0.21	4.5-6.0	Low-----------	0.49	5	<.5
Wheaton	6-68	18-27	1.45-1.70	0.6-2.0	0.11-0.19	4.5-6.0	Low-----------	0.37		
66UB*, 66UC*:										
Wheaton---------	0-6	18-27	1.45-1.65	0.6-2.0	0.13-0.21	4.5-6.0	Low-----------	0.49	5	<.5
	6-68	18-27	1.45-1.70	0.6-2.0	0.11-0.19	4.5-6.0	Low-----------	0.37		
Urban land.										
67UB*:										
Urban land.										
Wheaton---------	0-6	18-27	1.45-1.65	0.6-2.0	0.13-0.21	4.5-6.0	Low-----------	0.49	5	<.5
	6-68	18-27	1.45-1.70	0.6-2.0	0.11-0.19	4.5-6.0	Low-----------	0.37		
100*.										
Dumps, refuse										
109D, 109E-------	0-9	15-25	1.40-1.60	0.6-2.0	0.17-0.19	5.6-7.3	Low-----------	0.24	1	.5-2
Hyattstown	9-14	18-35	1.40-1.60	0.6-2.0	0.10-0.13	5.6-7.3	Low-----------	0.17		
	14-18	10-25	1.40-1.60	0.6-2.0	0.04-0.09	5.6-7.3	Low-----------	0.10		
	18-26	---	---	0.01-0.06	---	---	-------------	----		
	26	---	---	0.00-0.01	---	---	-------------	----		
116C, 116D, 116E-	0-6	15-25	1.40-1.60	0.6-2.0	0.10-0.16	5.6-7.3	Low-----------	0.24	1	.5-2
Blocktown	6-17	18-35	1.35-1.55	0.6-2.0	0.04-0.10	5.6-6.5	Low-----------	0.10		
	17-21	---	---	0.01-0.06	---	---	-------------	----		
	21	---	---	0.00-0.01	---	---	-------------	----		
200*.										
Pits, gravel										
201*.										
Pits, quarry										
300*:										
Rock outcrop.										
Blocktown-------	0-6	15-25	1.40-1.60	0.6-2.0	0.10-0.16	5.6-7.3	Low-----------	0.24	1	.5-2
	6-17	18-35	1.35-1.55	0.6-2.0	0.04-0.10	5.6-6.5	Low-----------	0.10		
	17-21	---	---	0.01-0.06	---	---	-------------	----		
	21	---	---	0.00-0.01	---	---	-------------	----		
400*.										
Urban land										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

("Flooding," "water table," and terms such as "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In				
1B, 1C Gaila	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
2A, 2B, 2C Glenelg	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
2UB*, 2UC*:												
Glenelg	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Urban land.												
4B, 4C Elioak	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
5A, 5B Glenville	C	None	---	---	0.5-3.0	Perched	Nov-Apr	60-99	---	High	High	Moderate.
6A Baile	D	None	---	---	0-0.5	Apparent	Nov-Apr	>60	---	High	High	High.
7UB*, 7UC*:												
Gaila	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Urban land.												
9B*, 9C*:												
Linganore	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	Moderate.
Hyattstown	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Low.
16B*, 16C*, 16D*:												
Brinklow	B	None	---	---	>6.0	---	---	20-40	Hard	Moderate	Moderate	High.
Blocktown	C/D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Low.
17B, 17C Occoquan	B	None	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In				
18C, 18E---------- Penn	C	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low-------	Moderate.
19A, 19B---------- Bucks	B	None---------	---	---	>6.0	---	---	>40	Soft	Moderate	Low-------	Moderate.
20A, 20B, 20C----- Brentsville	C	None---------	---	---	>6.0	---	---	20-40	Hard	Moderate	High-----	High.
21A, 21B, 21C, 21D, 21E--------- Penn	C	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low-------	Moderate.
21F*: Nestoria---------	C/D	None---------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
Rock outcrop.												
22A, 22B---------- Readington	C	None---------	---	---	1.5-3.0	Perched	Nov-Mar	>40	Soft	Moderate	Moderate	Moderate.
23A--------------- Croton	D	None---------	---	---	0-0.5	Perched	Nov-May	42-60	Hard	High-----	High-----	High.
24C, 24D---------- Montalto	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	High.
25B, 25C---------- Legore	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
26B, 26C---------- Montalto	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	High.
27B, 27C---------- Neshaminy	B	None---------	---	---	>6.0	---	---	48-99	Hard	Moderate	Moderate	Moderate.
28A--------------- Watchung	D	None---------	---	---	0-1.0	Apparent	Dec-Jun	>60	---	High-----	High-----	Moderate.
29B--------------- Jackland	D	None---------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High-----	High-----	Low.

See footnote at end of table.

TABLE 17.--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				
35B*:												
Chrome	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.
Conowingo	C	None	---	---	1.5-2.0	Apparent	Dec-Apr	42-60	Hard	High	High	High.
35C Chrome	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.
36A Conowingo	C	None	---	---	1.5-2.0	Apparent	Dec-Apr	42-60	Hard	High	High	High.
37B Travilah	C	None	---	---	1.0-2.0	Perched	Dec-Apr	20-40	Hard	High	High	Low.
41A, 41B Elsinboro	B	None	---	---	>5.0	Apparent	Dec-Apr	>60	---	Moderate	Moderate	High.
43A Elk	B	Occasional	Brief	Jan-Jun	>6.0	---	---	>60	---	High	Moderate	Moderate.
45A Delanco	C	Occasional	Very brief	Dec-Apr	1.0-2.5	Apparent	Dec-Apr	>60	---	High	High	High.
46A Huntington	B	Occasional	Brief	Dec-Mar	>6.0	---	---	60	---	High	Low	Moderate.
47A Lindside	C	Occasional	Very brief to brief.	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	>60	---	High	Moderate	Low.
48A Melvin	D	Occasional	Brief to long.	Dec-May	0-1.0	Apparent	Dec-May	>60	---	High	High	Low.
50A Rowland	C	Occasional	Brief	Nov-Mar	1.0-3.0	Apparent	Nov-May	>72	---	High	High	Moderate.
51A*:												
Bowmansville	B/D	Occasional	Brief	Nov-Jun	0-1.5	Apparent	Sep-May	72-99	---	High	High	Moderate.
Melvin	D	Occasional	Brief to long.	Dec-May	0-1.0	Apparent	Dec-May	>60	---	High	High	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In				
53A--------------- Codorus	C	Occasional	Very brief	Dec-Apr	1.0-2.0	Apparent	Nov-Apr	>60	---	High-----	High-----	Moderate.
54A--------------- Hatboro	D	Frequent----	Very brief	Nov-May	0-0.5	Apparent	Oct-May	>60	---	High-----	High-----	Moderate.
55C--------------- Evesboro	A	None---------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
57B, 57C, 57D----- Chillum	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	High.
57UB*:												
Chillum-----------	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	High.
Urban land.												
58B, 58C---------- Sassafras	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
59A, 59B---------- Beltsville	C	None---------	---	---	1.5-2.5	Perched	Nov-Apr	>60	---	High-----	High-----	High.
61B, 61C, 61D, 61E-------------- Croom	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
61UB*:												
Croom-------------	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
Urban land.												
64B*, 64C*:												
Croom-------------	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
Bucks-------------	B	None---------	---	---	>6.0	---	---	>40	Soft	Moderate	Low------	Moderate.
65B--------------- Wheaton	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
66UB*, 66UC*:												
Wheaton-----------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro- logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
66UB*, 66UC*:												
Urban land.												
67UB*:												
Urban land.												
Wheaton----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
100*. Dumps, refuse												
109D, 109E-------- Hyattstown	D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Low.
116C, 116D, 116E-- Blocktown	C/D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Low.
200*. Pits, gravel												
201*. Pits, quarry												
300*:												
Rock outcrop.												
Blocktown--------	C/D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Low.
400*. Urban land												

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Baile	Fine-loamy, mixed, mesic Typic Ochraquults
Beltsville	Fine-loamy, mixed, mesic Typic Fragiudults
Blocktown	Loamy-skeletal, mixed, mesic, shallow Typic Hapludults
Bowmansville	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Brentsville	Coarse-loamy, mixed, mesic Typic Hapludults
Brinklow	Fine-loamy, mixed, mesic Ochreptic Hapludults
Bucks	Fine-loamy, mixed, mesic Typic Hapludults
Chillum	Fine-silty, mixed, mesic Typic Hapludults
Chrome	Fine, mixed, mesic Typic Hapludalfs
Codorus	Fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Conowingo	Fine-loamy, mixed, mesic Aquic Hapludalfs
Croom	Loamy-skeletal, mixed, mesic Typic Hapludults
Croton	Fine-silty, mixed, mesic Typic Fragiaqualfs
Delanco	Fine-loamy, mixed, mesic Aquic Hapludults
Elioak	Clayey, kaolinitic, mesic Typic Hapludults
Elk	Fine-silty, mixed, mesic Ultic Hapludalfs
Elsinboro	Fine-loamy, mixed, mesic Typic Hapludults
Evesboro	Mesic, coated Typic Quartzipsamments
Gaila	Fine-loamy, mixed, mesic Ochreptic Hapludults
Glenelg	Fine-loamy, mixed, mesic Typic Hapludults
Glenville	Fine-loamy, mixed, mesic Aquic Fragiudults
Hatboro	Fine-loamy, mixed, nonacid, mesic Typic Fluvaquents
Huntington	Fine-silty, mixed, mesic Fluventic Hapludolls
Hyattstown	Loamy-skeletal, mixed, mesic, shallow Typic Hapludalfs
Jackland	Fine, montmorillonitic, mesic Aquic Hapludalfs
Legore	Fine-loamy, mixed, mesic Ultic Hapludalfs
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Linganore	Loamy-skeletal, mixed, mesic Ultic Hapludalfs
Melvin	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Montalto	Fine, mixed, mesic Ultic Hapludalfs
Neshaminy	Fine-loamy, mixed, mesic Ultic Hapludalfs
Nestoria	Loamy-skeletal, mixed, mesic, shallow Ultic Hapludalfs
Occoquan	Fine-loamy, mixed, mesic Ochreptic Hapludults
Penn	Fine-loamy, mixed, mesic Ultic Hapludalfs
Readington	Fine-loamy, mixed, mesic Typic Fragiudalfs
Rowland	Fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Sassafras	Fine-loamy, siliceous, mesic Typic Hapludults
Travilah	Fine-silty, mixed, mesic Aquic Hapludalfs
Watchung	Fine, mixed, mesic Typic Ochraqualfs
Wheaton	Fine-loamy, mixed, acid, mesic Typic Udorthents

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