United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Virginia Polytechnic Institute and State University

Soil Survey of Washington County Area and the City of Bristol, Virginia

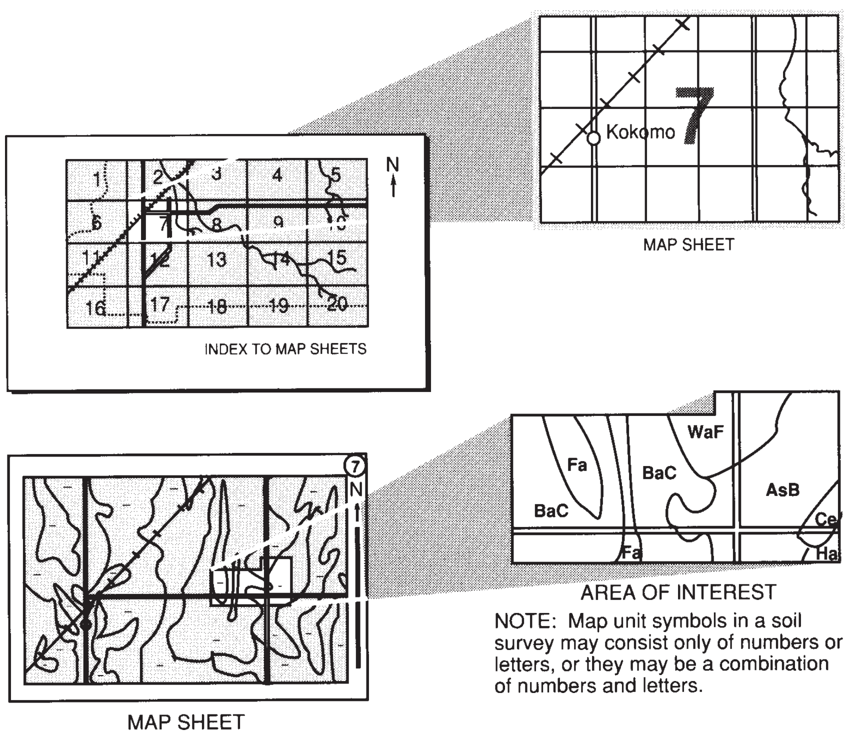
How To Use This Soil Survey

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

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

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

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



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.

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 1992. Soil names and descriptions were approved in 1993. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1993. The most current official data are available at http://soildatamart.nrcs.usda.gov. This survey was made cooperatively by the Natural Resources Conservation Service and the Virginia Polytechnic Institute and State University. The survey is part of the technical assistance furnished to the Holston River Soil and Water Conservation District. The Virginia Department of Conservation and Recreation and the Washington County Board of Supervisors provided financial assistance for the survey.

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

Cover: A typical landscape of the Valley and Ridge physiographic province within the survey area, near Abingdon.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

Contents

Issued 2006

Foreword

This soil survey contains information that affects land use planning in the survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, 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 the survey 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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. 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. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

M. Denise Doetzer
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Washington County Area and the City of Bristol, Virginia

By Danny R. Hatch, Virginia Polytechnic Institute and State University, and
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Fieldwork by Danny R. Hatch, Richard S. Joslyn, and Jeffrey R. Thomas,
Virginia Polytechnic Institute and State University

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
Virginia Polytechnic Institute and State University

THE WASHINGTON COUNTY AREA is in southwestern Virginia (fig. 1). The soil survey area consists of 349,000 acres and includes Washington County and the City of Bristol. The City of Bristol is in the southwestern part of the survey area.

Farming is the dominant enterprise in the survey area, although urban expansion, including housing, recreational facilities, and small industry, mainly in the City of Bristol, is replacing agriculture, especially in the southern part of the survey area. Although the South Holston Lake area is becoming more popular for housing, agricultural uses are still dominant. The steeper areas remain in woodland (fig. 2). Livestock production, primarily beef cattle, and dairying are the greatest sources of farm income. Corn, small grain, and hay are the main field crops. Burley tobacco is extensively grown and is the main cash crop. The survey area is about one-third woodland and about two-thirds agriculture.

Interstate Highway 81 runs the length of the survey area and intersects U.S. Routes 58 and 19. Other major highways in the survey area include U.S. Route 11 and State Highways 80, 75, and 91. Commercial air service is available at the Tri-Cities Airport, located 35 miles southwest of Abingdon.

A previous soil survey of Washington County was issued in 1945 *(14)*. The present soil survey updates the earlier survey and provides additional information and larger maps that show the soils in greater detail. Descriptions, names, and delineations of the soils in this soil survey do not fully agree with those on earlier soil maps or those in adjacent counties. Differences are the result of a better knowledge of soils, modifications in classification and series concepts, differences in the intensity of mapping, and differences in the extent of soils within the survey areas.

General Nature of the Survey Area

This section provides general information about the survey area. It describes history; physiography, relief, and drainage; and climate.

History

Washington County was formed in 1777 from part of Fincastle County. It was the first area in the country named in honor of George Washington. The first permanent

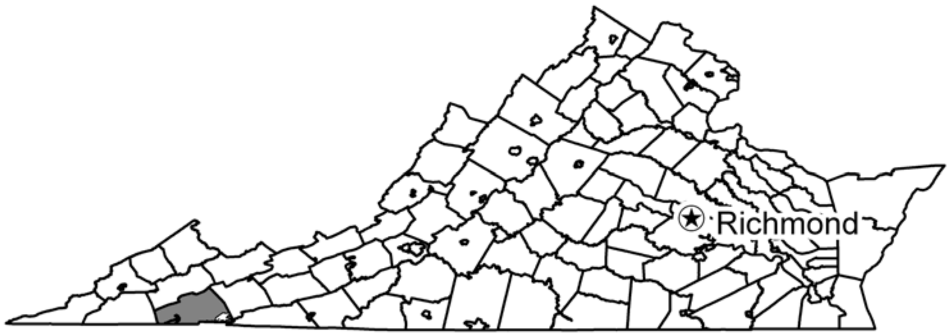

Figure 1.—Location of the Washington County Area in Virginia.

settlers, which were of Scotch and Irish descent, began to arrive in large numbers in 1768. Daniel Boone had marked a trail into Kentucky known as the “Wilderness Road.” This trail passed through Abingdon and for 20 years was the principal highway traveled by settlers in route to the West. By 1803, salt was being mined at Saltville from underground deposits, some of which are within the present boundaries of Washington County. Emory and Henry College, located at Emory, was founded in 1836. A railroad—the present-day Norfolk and Western Railroad—was completed in 1856 and extended as far west as Bristol. During the Civil War, Washington County was loyal to the Confederacy. In 1864, the Courthouse at Abingdon was burned by Union troops during a raid on Saltville.

The Barter Theater in Abingdon, the official State theater of Virginia, was founded in 1932 and is the oldest, longest-running professional resident theater in America. Other attractions in the county include the Martha Washington Inn, White’s Mill, and South Holston Lake.

During the past, most inhabitants in the county have lived in rural areas. Since 1960, however, the areas around the towns and communities throughout the county have increased in population.

Physiography, Relief, and Drainage

The Washington County Area dominantly lies in the Valley and Ridge physiographic province of Virginia *(23)*. The Whitetop Mountain area in the extreme southeastern corner of the county lies in the Blue Ridge physiographic province. The survey area consists of a broad valley, extending in a northeast-southwest direction, bordered on the northwest by Clinch Mountain and on the southeast by Iron Mountain. Elevations range from 1,330 feet near Mendota to 5,525 feet at the summit of Whitetop Mountain.

The Valley and Ridge physiographic province makes up about 95 percent of the survey area. It consists of fairly well defined valleys and intervening ridges. The dominant ridges are Clinch and Iron Mountains. Secondary ridges are Little and Walker Mountains, the Great Knobs, and the River Knobs. Limestone sinks have formed throughout the valleys, especially in the southern part of the survey area. Elevations range from 1,330 feet to approximately 4,000 feet.

The Blue Ridge physiographic province makes up only 5 percent of the land area and occurs in the southeastern tip of the survey area. The area is dominated by Whitetop Mountain, the second highest peak in Virginia. The slopes are steep and, in many places, are rugged and broken. Elevations range from approximately 3,000 feet to 5,525 feet.

The survey area is underlain almost entirely by sedimentary rocks consisting of limestone, shale, and sandstone. Limestone is the dominant rock underlying the main

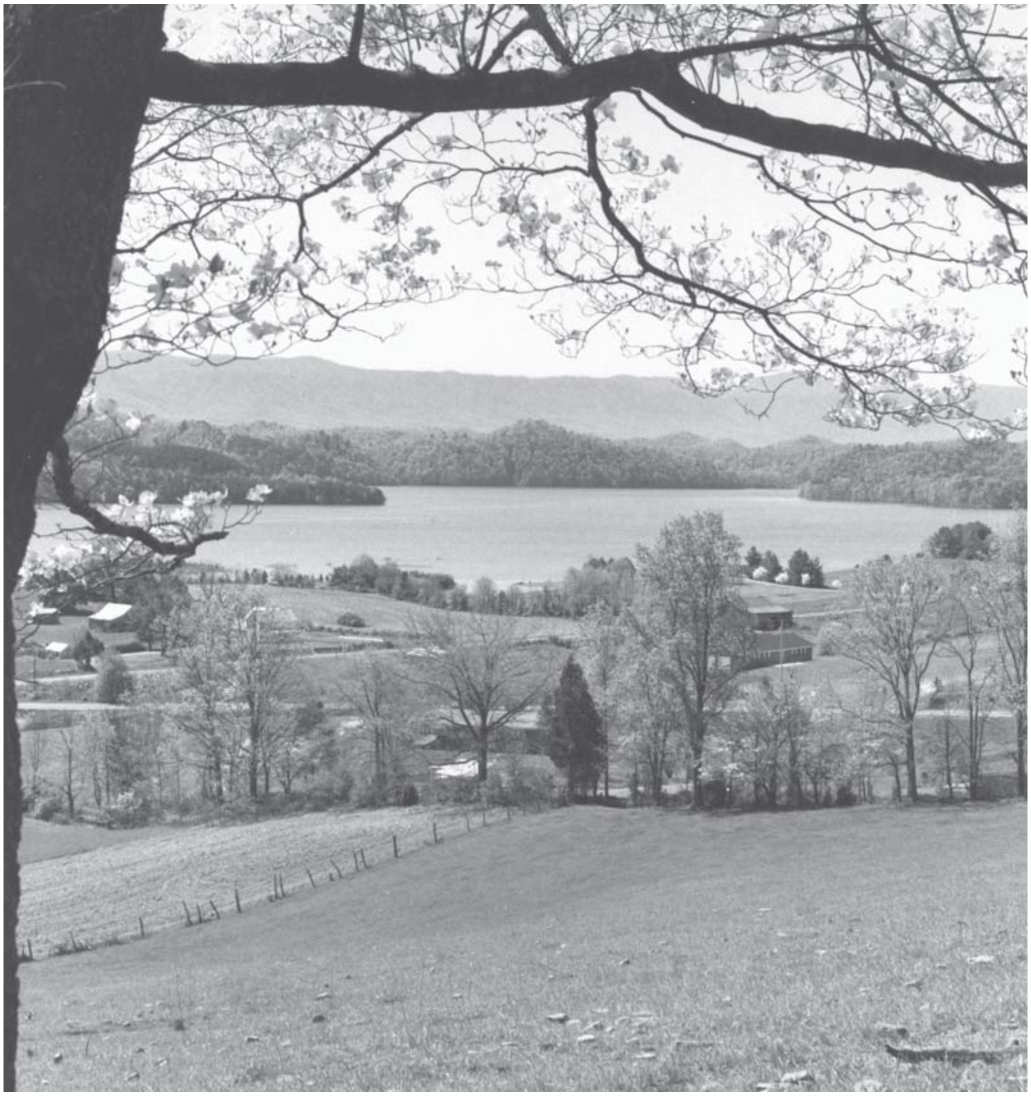

Figure 2.—The South Holston Lake area. This area is a popular area for housing development, but agricultural uses are still common and the steeper areas remain in woodland.

valley; sandstone and shale form the ridges. Rocks in the Whitetop Mountain area are dominantly metamorphosed rocks of igneous origin, including rhyolite, greenstone, and granite and some inclusions of quartzite and quartz pebble conglomerates.

The Washington County Area is drained by the North, Middle, and South Forks of the Holston River. All of these forks flow approximately parallel to the main valley, but their tributaries flow transversely to their course and break through the intervening ridges and knobs. Walker Mountain is the drainage divide between the North Fork of the Holston River and the Middle and South Forks of the Holston River.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Abingdon, Virginia, in the period 1971 to 2000. 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 36.4 degrees F and the average daily

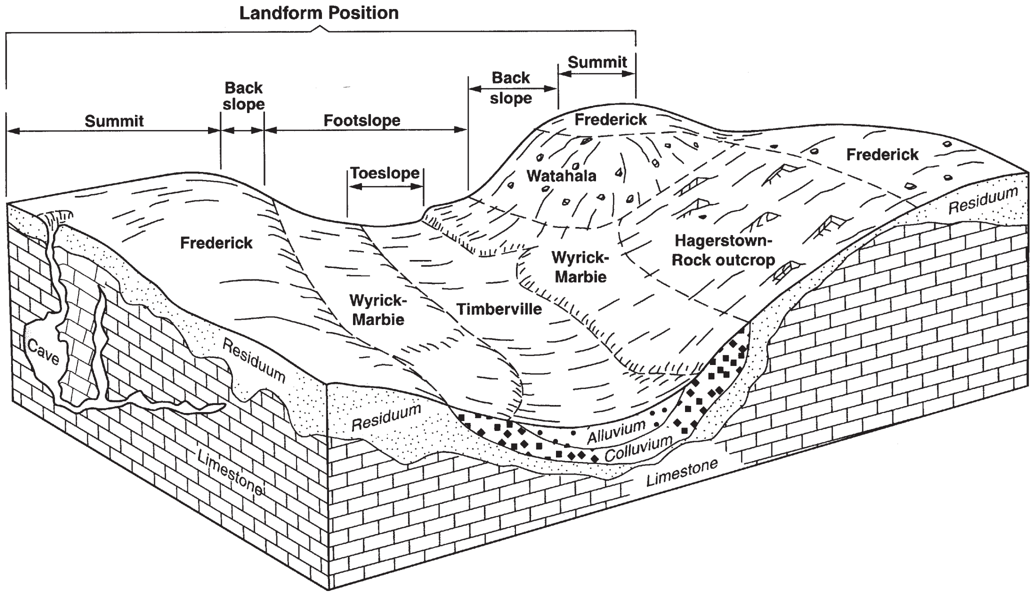

Figure 3.—A sequence of landforms in areas underlain by limestone in Washington County. The soils named on the land surface are shown in their natural relationship to each other and in their relationship to landform position.

minimum temperature is 25.4 degrees. The lowest temperature on record, which occurred on January 21, 1985, is -21 degrees. In summer, the average temperature is 71.3 degrees and the average daily maximum temperature is 83.9 degrees. The highest recorded temperature, which occurred on August 17, 1988, is 100 degrees.

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

The total annual precipitation is 47.41 inches. Of this, 21.08 inches, or about 44 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 3.44 inches, which occurred on July 15, 1973. Thunderstorms occur on about 43 days each year, and most occur between May and August.

The average seasonal snowfall is 16.2 inches. The greatest snow depth at any one time during the period of record was 18 inches, recorded on January 8, 1996. On the average, 14 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 heaviest 1-day snowfall on record was 12.0 inches, recorded on February 2, 1996.

The average relative humidity in midafternoon is about 48 percent in April and 60 percent in mid-winter. Humidity is higher at night, and the average at dawn is about 80 percent in winter and 90 percent in summer. The sun shines 63 percent of the time possible in summer and 42 percent in winter. The prevailing wind is from the southwest, except from August through October when it is from the northeast. Average windspeed is highest, 7 miles per hour, in March and April.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and

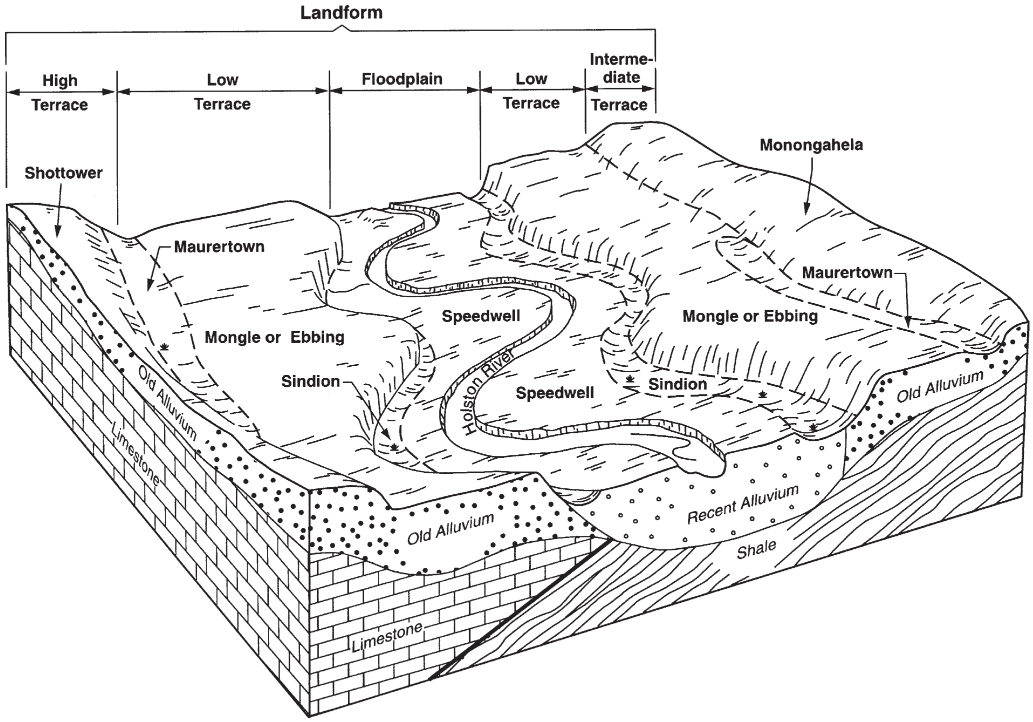

Figure 4.—A sequence of landforms along the Holston River in Washington County. The soils named on the land surface are shown in their natural relationship to each other and in their relationship to landform position.

miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; 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 and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. (See figures 3 and 4.) By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area 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-vegetation-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. Soil taxonomy, 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 and 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 predict 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.

Detailed Soil Map Units

The map units delineated on the detailed soil maps represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. 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 other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties 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, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit 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, 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, slope, stoniness, salinity, 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, Tumbling loam, 15 to 25 percent slopes, is a phase of the Tumbling series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Wyrick-Marbie complex, 7 to 15 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example.

Table 4 lists the map units in this survey area and gives the acreage of each. Other 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.

1B—Allegheny loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Intermediate stream terraces in river valleys
Position on the landform: Treads
Size of areas: 2 to 30 acres

Map Unit Composition

Allegheny and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—brown loam

Subsoil:
10 to 22 inches—yellowish brown clay loam
22 to 42 inches—yellowish brown gravelly sandy clay loam; black manganese coatings
42 to 65 inches—yellowish brown gravelly sandy clay loam; brownish yellow mottles and black manganese coatings

Minor Components

Dissimilar components:
- Monongahela soils, which are moderately well drained; in similar areas
- Wheeling and Ingledove soils, which are susceptible to flooding; on low stream terraces
- Westmoreland soils, which are shallower to bedrock than the Allegheny soil; on uplands
- Weikert soils, which are shallower to bedrock than the Allegheny soil; on uplands

Similar components:
- Shottower soils, which have more clay in the subsoil than the Allegheny soil and are redder; in similar areas and on high river terraces

Soil Properties and Qualities

Available water capacity: Moderate (about 6.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)

Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Coarse textured soil layers increase the amount of maintenance needed for haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- This soil is well suited to building sites.

Septic tank absorption fields

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: L
Hydric soil: No

1C—Allegheny loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Intermediate stream terraces in river valleys
Position on the landform: Treads
Size of areas: 2 to 20 acres

Map Unit Composition

Allegheny and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—brown loam

Subsoil:
10 to 22 inches—yellowish brown clay loam
22 to 42 inches—yellowish brown gravelly sandy clay loam; black manganese coatings
42 to 65 inches—yellowish brown gravelly sandy clay loam; few brownish yellow mottles and black manganese coatings

Minor Components

Dissimilar components:
- Monongahela soils, which are moderately well drained; in similar areas
- Wheeling and Ingledove soils, which are susceptible to flooding; on low stream terraces
- Westmoreland soils, which are shallower to bedrock than the Allegheny soil; on uplands
- Weikert soils, which are shallower to bedrock than the Allegheny soil; on uplands

Similar components:
- Shottower soils, which have more clay in the subsoil than the Allegheny soil and are redder; in similar areas and on high river terraces

Soil Properties and Qualities

Available water capacity: Moderate (about 6.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Coarse textured soil layers increase the amount of maintenance needed for roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: L
Hydric soil: No

2A—Atkins loam, 0 to 3 percent slopes, frequently flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Floodplains along small creeks

Position on the landform: Floodplain steps and backswamps
Size of areas: 2 to 30 acres

Map Unit Composition

Atkins and similar soils: Typically 75 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown loam

Subsoil:
4 to 28 inches—grayish brown loam; reddish brown masses of oxidized iron

Substratum:
28 to 40 inches—gray loam
40 to 65 inches—gray gravelly loam

Minor Components

Dissimilar components:
- Ernest soils, which are moderately well drained; on colluvial footslopes
- Macove soils, which are well drained and have more rock fragments than the Atkins soil; on colluvial footslopes
- Tate and Tumbling soils, which are well drained; on colluvial footslopes
- Soils that have stony surfaces, in similar areas
- Lobdell soils, which are moderately well drained; in similar areas which are slightly higher in elevation

Similar components:
- Soils that have more clay and/or silt in the lower layers than the Atkins soil, in similar areas
- Soils that have a thin organic surface layer, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.9 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Poorly drained
Depth to seasonal water saturation: About 0 to 12 inches
Water table kind: Apparent
Flooding hazard: Frequent
Ponding hazard: Frequent
Depth of ponding: 0.1 to 1.0 foot
Shrink-swell potential: Low
Runoff class: Negligible
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Poorly suited
- Effective pasture management practices include maintaining a mixture of forages,

applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Vegetation is limited to species that can tolerate wetness and poor drainage.
- To minimize the potential of ground-water pollution, pesticides and fertilizers should not be applied to poorly and very poorly drained soils; mechanical control of undesirable vegetation and deferred grazing are recommended.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.

Woodland

Suitability: Well suited to sweetgum
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should focus on streamside management zones and stream crossings and should include general adherence to all applicable best management practices.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding and ponding restrict the safe use of roads by log trucks.
- Soil wetness may limit the use of equipment.

Building sites

- Because of the flooding, this soil is unsuited to building site development.
- Because of the frequent flooding, the risk of damage associated with floodwaters is greatly increased.
- Because of ponding, this soil is unsuited to building site development.
- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed.

Septic tank absorption fields

- Because of flooding and ponding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6w
Virginia soil management group: NN
Hydric soil: Yes

3D—Berks silt loam, 7 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills and mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 100 acres

Map Unit Composition

Berks and similar soils: Typically 75 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 2 inches—very dark grayish brown silt loam

Subsoil:
2 to 15 inches—yellowish brown channery silt loam
15 to 36 inches—yellowish brown very channery silty clay loam

Hard bedrock:
36 inches—shale bedrock

Minor Components

Dissimilar components:
- Hayter soils, which are deeper to bedrock than the Berks soil; on colluvial footslopes
- Ernest soils, which are moderately well drained; on colluvial footslopes
- Bland soils, which have more clay in the subsoil than the Berks soil; in similar areas
- Macove soils, which are deeper to bedrock than the Berks soil; on footslopes
- Westmoreland soils, which have fewer rock fragments, are better developed, and are deeper to bedrock than the Berks soil; in similar areas
- Rubbly areas that are in the drainageways in the areas near Clinch Mountain

Similar components:
- Calvin soils, which have a redder subsoil than the Berks soil; in similar areas
- Weikert soils, which are well drained and shallower to bedrock than the Berks soil; in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn and tobacco; not suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.

- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Poorly suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.
- Coarse soil textures may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, special design of local roads and streets is needed.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: JJ
Hydric soil: No

3E—Berks silt loam, 25 to 50 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills and mountains on uplands
Position on the landform: Backslopes
Size of areas: 25 to 500 acres

Map Unit Composition

Berks and similar soils: Typically 75 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 2 inches—very dark grayish brown silt loam

Subsoil:
2 to 15 inches—yellowish brown channery silt loam
15 to 36 inches—yellowish brown very channery silty clay loam

Hard bedrock:
36 inches—shale bedrock

Minor Components

Dissimilar components:
- Hayter soils, which are deeper to bedrock than the Berks soil; on colluvial footslopes
- Ernest soils, which are moderately well drained; on colluvial footslopes
- Bland soils, which have more clay in the subsoil than the Berks soil; in similar areas
- Macove soils, which are deeper to bedrock than the Berks soil; on footslopes
- Westmoreland soils, which have fewer rock fragments, are better developed, and are deeper to bedrock than the Berks soil; in similar areas
- Rubbly areas that are in the drainageways in the areas near Clinch Mountain

Similar components:
- Calvin soils, which have a redder subsoil than the Berks soil; in similar areas
- Weikert soils, which are somewhat excessively drained and shallower to bedrock than the Berks soil; in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Coarse soil textures may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland

Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

3F—Berks silt loam, 50 to 80 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills and mountains on uplands
Position on the landform: Backslopes
Size of areas: 25 to 500 acres

Map Unit Composition

Berks and similar soils: Typically 75 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 2 inches—very dark grayish brown silt loam

Subsoil:
2 to 15 inches—yellowish brown channery silt loam
15 to 36 inches—yellowish brown very channery silty clay loam

Hard bedrock:
36 inches—shale bedrock

Minor Components

Dissimilar components:
- Hayter soils, which are deeper to bedrock than the Berks soil; on colluvial footslopes
- Ernest soils, which are moderately well drained; on colluvial footslopes
- Bland soils, which have more clay in the subsoil than the Berks soil; in similar areas
- Macove soils, which are deeper to bedrock than the Berks soil; on footslopes
- Westmoreland soils, which have fewer rock fragments, are better developed, and are deeper to bedrock than the Berks soil; in similar areas
- Rubbly areas that are in the drainageways in the areas near Clinch Mountain

Similar components:
- Calvin soils, which have a redder subsoil than the Berks soil; in similar areas
- Weikert soils, which are somewhat excessively drained and shallower to bedrock than the Berks soil; in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High

Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Coarse soil textures may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

4D—Bland silty clay loam, 15 to 25 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 20 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 1 to 2 percent of the surface.

Bland and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—reddish brown silty clay loam

Subsoil:
5 to 11 inches—reddish brown silty clay; yellowish red mottles
11 to 24 inches—reddish brown silty clay

Hard bedrock:
24 inches—reddish brown limestone bedrock

Minor Components

Dissimilar components:
- Westmoreland soils, which have less clay in the subsoil and are deeper to bedrock than the Bland soil; in similar areas
- Soils that are shallow to bedrock, near rock outcrops
- Berks soils, which have less clay and more rock fragments than the Bland soil; in similar areas

Similar components:
- Soils that have bedrock at a depth of 40 to 60 inches

Soil Properties and Qualities

Available water capacity: Low (about 3.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.20 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone
Distinctive soil property: This soil has the potential for slippage

Use and Management Considerations

Cropland

Suitability: Moderately suited to tobacco and grass-legume hay; poorly suited to corn; not suited to alfalfa hay

- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- Rock outcrops may limit machinery operations.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- Rock outcrops may limit machinery operations.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.

- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads is increased.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: Y
Hydric soil: No

4E—Bland silty clay loam, 25 to 50 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 1 to 2 percent of the surface.

Bland and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—reddish brown silty clay loam

Subsoil:
5 to 11 inches—reddish brown silty clay; many yellowish red mottles
11 to 24 inches—reddish brown silty clay

Hard bedrock:
24 inches—reddish brown limestone bedrock

Minor Components

Dissimilar components:
- Westmoreland soils, which have less clay in the subsoil and are deeper to bedrock than the Bland soil; in similar areas
- Soils that are shallow to bedrock, near rock outcrops
- Berks soils, which have less clay and more rock fragments than the Bland soil; in similar areas

Similar components:
- Soils that have bedrock at a depth of 40 to 60 inches

Soil Properties and Qualities

Available water capacity: Low (about 3.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.20 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone
Distinctive soil property: This soil has the potential for slippage

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and

basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: Y
Hydric soil: No

5B—Botetourt loam, 2 to 7 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Low stream terraces along the North Fork of the Holston River
Position on the landform: Treads
Size of areas: 5 to 50 acres

Map Unit Composition

Botetourt and similar soils: Typically 80 percent; ranging from about 75 to 85 percent

Typical Profile

Surface layer:
0 to 8 inches—brown loam

Subsoil:
8 to 23 inches—yellowish brown clay loam
23 to 49 inches—yellowish brown clay loam; light gray iron depletions and strong brown masses of oxidized iron

Substratum:
49 to 65 inches—light brownish gray and strong brown fine sandy loam

Minor Components

Dissimilar components:
- Soils that are poorly drained, on similar landforms
- Wolfgap soils, which are well drained, have less developed subsoils, and are more susceptible to flooding than the Botetourt soil; on floodplains

Similar components:
- Mongle soils, which are somewhat poorly drained; in similar areas
- Ingledove soils, which are well drained; in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 30 inches
Water table kind: Apparent
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental

benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- Because of flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding and low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: G
Hydric soil: No

6D—Calvin silt loam, 7 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 10 acres

Map Unit Composition

Calvin and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—reddish brown silt loam

Subsoil:
6 to 21 inches—yellowish red channery silt loam

Substratum:
21 to 29 inches—reddish brown extremely channery silt loam

Hard bedrock:
29 inches—reddish brown sandstone bedrock

Minor Components

Dissimilar components:
- Macove soils, which are deeper to bedrock than the Calvin soil; on concave footslopes and along drainageways

- Drypond soils, which are excessively drained and shallower to bedrock than the Calvin soil; in similar areas
- Areas of red siltstone and sandstone rock outcrops, in similar areas
- Areas that have white sandstone boulders on the surface, in similar areas
- Westmoreland soils, which are deeper to bedrock and are yellower than the Calvin soil; in similar areas

Similar components:
- Berks soils, which are yellower and have more silt than the Calvin soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.1 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn and tobacco; not suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Poorly suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.

- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: JJ
Hydric soil: No

6E—Calvin silt loam, 25 to 50 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 10 to 100 acres

Map Unit Composition

Calvin and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—reddish brown silt loam

Subsoil:
6 to 21 inches—yellowish red channery silt loam

Substratum:
21 to 29 inches—reddish brown extremely channery silt loam

Hard bedrock:
29 inches—reddish brown sandstone bedrock

Minor Components

Dissimilar components:
- Macove soils, which are deeper to bedrock than the Calvin soil; on concave footslopes and along drainageways
- Drypond soils, which are excessively drained and shallower to bedrock than the Calvin soil; in similar areas
- Areas of red siltstone and sandstone rock outcrops, in similar areas
- Areas that have white sandstone boulders on the surface, in similar areas
- Westmoreland soils, which are deeper to bedrock and are yellower than the Calvin soil; in similar areas

Similar components:
- Berks soils, which are yellower and have more silt than the Calvin soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.1 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

6F—Calvin silt loam, 50 to 65 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 10 to 100 acres

Map Unit Composition

Calvin and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—reddish brown silt loam

Subsoil:
6 to 21 inches—yellowish red channery silt loam

Substratum:
21 to 29 inches—reddish brown extremely channery silt loam

Hard bedrock:
29 inches—reddish brown sandstone bedrock

Minor Components

Dissimilar components:
- Macove soils, which are deeper to bedrock than the Calvin soil; on concave footslopes and along drainageways
- Drypond soils, which are excessively drained and shallower to bedrock than the Calvin soil; in similar areas
- Areas of red siltstone and sandstone rock outcrops, in similar areas
- Areas that have white sandstone boulders on the surface, in similar areas
- Westmoreland soils, which are deeper to bedrock and are yellower than the Calvin soil; in similar areas

Similar components:
- Berks soils, which are yellower and have more silt than the Calvin soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.1 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.

- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

7A—Clubcaf silt loam, 0 to 3 percent slopes, frequently flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Floodplains along small creeks
Position on the landform: Floodplain steps and backswamps
Size of areas: 2 to 50 acres

Map Unit Composition

Clubcaf and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown silt loam; strong brown masses of oxidized iron

Subsurface layer:
10 to 25 inches—very dark grayish brown loam; strong brown masses of oxidized iron

Subsoil:
25 to 41 inches—very dark gray loam; yellowish brown masses of oxidized iron

Substratum:
41 to 65 inches—dark gray very gravelly loam

Minor Components

Dissimilar components:
- Hayter soils, which are well drained; on footslopes
- Sindion soils, which are moderately well drained; on floodplains
- Soils that have bedrock at a depth of less than 60 inches
- Wyrick soils, which are well drained; on footslopes

Similar components:
- Soils that have gravelly or sandy subsurface layers, in similar areas

Soil Properties and Qualities

Available water capacity: High (about 9.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Poorly drained
Depth to seasonal water saturation: About 0 to 18 inches
Water table kind: Apparent
Flooding hazard: Frequent
Ponding hazard: Frequent
Depth of ponding: 0.1 to 0.5 foot
Shrink-swell potential: Low
Runoff class: Negligible
Surface fragments: None
Parent material: Alluvium derived from limestone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Poorly suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Vegetation is limited to species that can tolerate wetness and poor drainage.
- Restricting access during wet periods can minimize compaction.
- To minimize the potential of ground-water pollution, pesticides and fertilizers should not be applied to poorly and very poorly drained soils; mechanical control of undesirable vegetation and deferred grazing are recommended.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.

Woodland

Suitability: Well suited to sweetgum
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should focus on streamside management zones and stream crossings and should include general adherence to all applicable best management practices.

- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding and ponding restrict the safe use of roads by log trucks.

Building sites

- Because of the flooding, this soil is unsuited to building site development.
- Because of the frequent flooding, the risk of damage associated with floodwaters is greatly increased.
- Because of ponding, this soil is unsuited to building site development.
- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed.

Septic tank absorption fields

- Because of flooding and ponding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6w
Virginia soil management group: NN
Hydric soil: Yes

8D—Dekalb channery loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 30 acres

Map Unit Composition

Dekalb and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—very dark grayish brown channery loam

Subsoil:
2 to 21 inches—yellowish brown channery loam

Substratum:
21 to 29 inches—yellowish brown extremely channery sandy loam

Hard bedrock:
29 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Westmoreland soils, which are deeper to bedrock and have fewer rock fragments than the Dekalb soil; in similar areas
- Tumbling soils, which have more clay in the subsoil, are deeper to bedrock, and have fewer rock fragments than the Dekalb soil; on colluvial footslopes
- Macove soils, which are deeper to bedrock and have more rock fragments on the surface than the Dekalb soil; on colluvial footslopes
- Areas that have sandstone stones covering 1 to 3 percent of the surface, in similar areas

Similar components:
- Lily soils, which have fewer rock fragments than the Dekalb soil; in similar areas
- Drypond soils, which are excessively drained and shallower to bedrock than the Dekalb soil; in the steeper areas
- Soils that have more silt in the subsoil than the Dekalb soil, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.8 inches)
Slowest saturated hydraulic conductivity: High (about 6.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from sandstone

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn and tobacco; not suited to alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Poorly suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.

- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: FF
Hydric soil: No

8E—Dekalb channery loam, 25 to 60 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 5 to 350 acres

Map Unit Composition

Dekalb and similar soils: Typically 85 percent; ranging from about 75 to 95 percent

Typical Profile

Surface layer:
0 to 2 inches—very dark grayish brown channery loam

Subsoil:
2 to 21 inches—yellowish brown channery loam

Substratum:
21 to 29 inches—yellowish brown extremely channery sandy loam

Hard bedrock:
29 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Westmoreland soils, which are deeper to bedrock and have fewer rock fragments than the Dekalb soil; in similar areas
- Tumbling soils, which have more clay in the subsoil, are deeper to bedrock, and have fewer rock fragments than the Dekalb soil; on colluvial footslopes
- Macove soils, which are deeper to bedrock and have more rock fragments on the surface than the Dekalb soil; on colluvial footslopes
- Areas that have sandstone stones covering 1 to 3 percent of the surface, in similar areas

Similar components:
- Lily soils, which have fewer rock fragments than the Dekalb soil; in similar areas
- Drypond soils, which are excessively drained and shallower to bedrock than the Dekalb soil; in the steeper areas
- Soils that have more silt in the subsoil than the Dekalb soil, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.8 inches)
Slowest saturated hydraulic conductivity: High (about 6.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from sandstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: FF
Hydric soil: No

9F—Drypond-Rock outcrop complex, 25 to 80 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Summits, shoulders, and backslopes; rock outcrops can be near-vertical cliffs
Size of areas: 2 to 100 acres

Map Unit Composition

Note: The Drypond soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Drypond and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Rock outcrop: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Dekalb

Surface layer:
0 to 3 inches—dark grayish brown channery loam

Subsoil:
3 to 12 inches—light yellowish brown channery loam

Substratum:
12 to 19 inches—yellowish brown extremely channery loam

Hard bedrock:
19 inches—sandstone bedrock

Rock outcrop

This part of the map unit consists of outcrops of sandstone bedrock. The outcrops range from a few inches tall to 50 feet in height as near-vertical cliffs.

Minor Components

Dissimilar components:
- Calvin and Lily soils, which are deeper to bedrock than the Drypond soil; in similar areas
- Macove soils, which are well drained and deeper to bedrock than the Drypond soil; on colluvial footslopes
- Sandy soils that have subhorizons which are high in humus and iron, in similar areas

Similar components:
- Weikert soils, which are well drained and developed from shale residuum; on ridgetop summits and steep backslopes
- Dekalb soils, which are deeper to bedrock and have fewer rock fragments in the subsoil than the Drypond soil; in similar areas

Properties and Qualities of the Drypond Soil

Available water capacity: Very low (about 1.4 inches)
Slowest saturated hydraulic conductivity: High (about 6.0 in/hr)
Depth class: Shallow (10 to 20 inches)
Depth to root-restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from sandstone and/or residuum weathered from quartzite

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pasture

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Drypond—7s; Rock outcrop—8s
Virginia soil management group: Drypond—JJ; Rock outcrop—none assigned
Hydric soils: No

10F—Drypond channery loam, 50 to 80 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 5 to 250 acres

Map Unit Composition

Drypond and similar soils: Typically 75 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 3 inches—dark grayish brown channery loam

Subsoil:
3 to 12 inches—light yellowish brown channery loam

Substratum:
12 to 19 inches—yellowish brown extremely channery loam

Hard bedrock:
19 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Calvin and Lily soils, which are well drained and deeper to bedrock than the Drypond soil; in similar areas
- Macove soils, which are well drained and deeper to bedrock than the Drypond soil; on colluvial footslopes
- Sandstone escarpments, which are as much as 100 feet high
- Soils that have a high content of sand and have subhorizons high in humus and iron, in similar areas

Similar components:
- Weikert soils, which are well drained and developed from shale residuum; on ridgetop summits and steep backslopes
- Dekalb soils, which are deeper to bedrock and have fewer rock fragments in the subsoil than the Drypond soil; in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 1.4 inches)
Slowest saturated hydraulic conductivity: High (about 6.0 in/hr)
Depth class: Shallow (10 to 20 inches)
Depth to root-restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Excessively drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from sandstone and/or residuum weathered from quartzite

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

11B—Ebbing loam, 2 to 7 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Low stream terraces along the Middle and South Forks of the Holston River
Position on the landform: Treads
Size of areas: 2 to 50 acres

Map Unit Composition

Ebbing and similar soils: Typically 90 percent; ranging from about 85 to 95 percent

Typical Profile

Surface layer:
0 to 14 inches—dark yellowish brown loam

Subsoil:
14 to 27 inches—yellowish brown clay loam
27 to 45 inches—reddish yellow and brownish yellow loam; light gray iron depletions

Substratum:
45 to 65 inches—light gray loam; reddish yellow masses of oxidized iron

Minor Components

Dissimilar components:
- Maurertown soils, which are poorly drained; on similar landforms and in backswamps
- Speedwell soils, which are well drained; on floodplains

Similar components:
- Mongle soils, which are somewhat poorly drained; in similar areas
- Wheeling soils, which are well drained; in similar areas
- Wyrick and Tate soils, which are well drained; on colluvial footslopes

Soil Properties and Qualities

Available water capacity: High (about 10.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 36 inches
Water table kind: Apparent
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Fine-loamy alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- The root system of some shallow-rooted crops may be damaged by frost action.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.

Woodland

Suitability: Well suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- Soil wetness may limit the use of equipment.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- This soil is unsuited to septic tank absorption fields. The rare flooding limits the absorption and proper treatment of effluent from septic systems, and rapidly moving floodwaters may damage some components of septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding and the structural damage caused by low soil strength.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: G
Hydric soil: No

12C—Edneytown loam, 7 to 15 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Hills and mountains on uplands
Position on the landform: Summits and shoulders
Size of areas: 2 to 5 acres

Map Unit Composition

Edneytown and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 4 inches—brown loam

Subsurface layer:
4 to 7 inches—yellowish brown loam

Subsoil:
7 to 20 inches—strong brown sandy clay loam
20 to 27 inches—strong brown sandy loam

Substratum:
27 to 62 inches—brownish yellow loamy sand

Minor Components

Dissimilar components:
- Konnarock soils, which are shallower to bedrock and have more rock fragments than the Edneytown soil; on similar landforms
- Pigeonroost soils, which are shallower to bedrock than the Edneytown soil; on similar landforms
- Greenlee soils, which have more rock fragments in the soil and on the surface than the Edneytown soil; on footslopes

Similar components:
- Soils that have bedrock at a depth of 40 to 60 inches, on similar landforms

Soil Properties and Qualities

Available water capacity: Moderate (about 7.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from granite and gneiss

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar and eastern white pine; moderately suited to northern red oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is are well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: L
Hydric soil: No

12D—Edneytown loam, 15 to 25 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Hills and mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 5 acres

Map Unit Composition

Edneytown and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 4 inches—brown loam

Subsurface layer:
4 to 7 inches—yellowish brown loam

Subsoil:
7 to 20 inches—strong brown sandy clay loam
20 to 27 inches—strong brown sandy loam

Substratum:
27 to 62 inches—brownish yellow loamy sand

Minor Components

Dissimilar components:
- Konnarock soils, which are shallower to bedrock and have more rock fragments than the Edneytown soil; on similar landforms
- Pigeonroost soils, which are shallower to bedrock than the Edneytown soil; on similar landforms
- Greenlee soils, which have more rock fragments in the soil and on the surface than the Edneytown soil; on footslopes

Similar components:
- Soils that have bedrock at a depth of 40 to 60 inches, on similar landforms

Soil Properties and Qualities

Available water capacity: Moderate (about 7.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from granite and gneiss

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar and eastern white pine; moderately suited to northern red oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: L
Hydric soil: No

12E—Edneytown loam, 25 to 35 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Hills and mountains on uplands
Position on the landform: Backslopes
Size of areas: 2 to 5 acres

Map Unit Composition

Edneytown and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 4 inches—brown loam

Subsurface layer:
4 to 7 inches—yellowish brown loam

Subsoil:
7 to 20 inches—strong brown sandy clay loam
20 to 27 inches—strong brown sandy loam

Substratum:
27 to 62 inches—brownish yellow loamy sand

Minor Components

Dissimilar components:
- Konnarock soils, which are shallower to bedrock and have more rock fragments than the Edneytown soil; on similar landforms
- Pigeonroost soils, which are shallower to bedrock than the Edneytown soil; on similar landforms
- Greenlee soils, which have more rock fragments in the soil and on the surface than the Edneytown soil; on footslopes

Similar components:
- Soils that have bedrock at a depth of 40 to 60 inches, on similar landforms

Soil Properties and Qualities

Available water capacity: Moderate (about 7.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from granite and gneiss

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- The slope may restrict the use of some equipment.

Woodland

Suitability: Well suited to yellow-poplar and eastern white pine; moderately suited to northern red oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6e
Virginia soil management group: L
Hydric soil: No

13C—Elliber very gravelly silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills and mountains on uplands
Position on the landform: Summits and shoulders
Size of areas: 2 to 45 acres

Map Unit Composition

Elliber and similar soils: Typically 80 percent; ranging from about 75 to 85 percent

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown very gravelly silt loam

Subsurface layer:
6 to 20 inches—pale brown very gravelly silt loam

Subsoil:
20 to 38 inches—yellowish brown very gravelly silt loam
38 to 49 inches—strong brown very gravelly silty clay loam
49 to 65 inches—brownish yellow extremely gravelly silt loam

Minor Components

Dissimilar components:
- Lily soils, which are shallower to bedrock than the Elliber soil; in similar areas
- Weikert soils, which are well drained and shallower to bedrock than the Elliber soil; in similar areas
- Rock outcrops in similar areas

Similar components:
- Watahala soils, which are redder and have more clay in the lower part of the subsoil than the Elliber soil; in similar areas
- Westmoreland soils, which have fewer chert gravel than the Elliber soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Gravelly colluvium over gravelly residuum weathered from cherty limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.

- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4s
Virginia soil management group: M
Hydric soil: No

13D—Elliber very gravelly silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills and mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 75 acres

Map Unit Composition

Elliber and similar soils: Typically 80 percent; ranging from about 75 to 85 percent

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown very gravelly silt loam

Subsurface layer:
6 to 20 inches—pale brown very gravelly silt loam

Subsoil:
20 to 38 inches—yellowish brown very gravelly silt loam
38 to 49 inches—strong brown very gravelly silty clay loam
49 to 65 inches—brownish yellow extremely gravelly silt loam

Minor Components

Dissimilar components:
- Lily soils, which are shallower to bedrock than the Elliber soil; in similar areas
- Weikert soils, which are well drained and shallower to bedrock than the Elliber soil; in similar areas
- Rock outcrops in similar areas

Similar components:
- Watahala soils, which are redder and have more clay in the lower part of the subsoil than the Elliber soil; in similar areas
- Westmoreland soils, which have fewer chert gravel than the Elliber soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Gravelly colluvium over gravelly residuum weathered from cherty limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: M
Hydric soil: No

13E—Elliber very gravelly silt loam, 25 to 65 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills and mountains on uplands
Position on the landform: Backslopes
Size of areas: 5 to 120 acres

Map Unit Composition

Elliber and similar soils: Typically 80 percent; ranging from about 75 to 85 percent

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown very gravelly silt loam

Subsurface layer:
6 to 20 inches—pale brown very gravelly silt loam

Subsoil:
20 to 38 inches—yellowish brown very gravelly silt loam
38 to 49 inches—strong brown very gravelly silty clay loam
49 to 65 inches—brownish yellow extremely gravelly silt loam

Minor Components

Dissimilar components:
- Lily soils, which are shallower to bedrock than the Elliber soil; in similar areas
- Weikert soils, which are well drained and shallower to bedrock than the Elliber soil; in similar areas
- Rock outcrops in similar areas

Similar components:
- Watahala soils, which are redder and have more clay in the lower part of the subsoil than the Elliber soil; in similar areas
- Westmoreland soils, which have fewer chert gravel than the Elliber soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Gravelly colluvium over gravelly residuum weathered from cherty limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.

- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: M
Hydric soil: No

14B—Ernest silt loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 30 acres

Map Unit Composition

Ernest and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 18 inches—yellowish brown silt loam
18 to 30 inches—yellowish brown silt loam; strong brown masses of oxidized iron and light gray iron depletions
30 to 38 inches—light brownish gray silty clay loam; yellowish brown masses of oxidized iron
38 to 65 inches—light brownish gray loam; yellowish brown masses of oxidized iron

Minor Components

Dissimilar components:
- Hayter, Tate, and Tumbling soils, which are well drained and do not have fragipans; in similar areas
- Macove soils, which are well drained, do not have fragipans, and have more rock fragments in the subsoil than the Ernest soil; in similar areas
- Berks and Faywood soils, which are well drained and shallower to bedrock than the Ernest soil; on uplands
- Lobdell soils, which are moderately well drained; on floodplains
- Atkins soils, which are poorly drained; on floodplains
- Weikert soils, which are well drained and shallower to bedrock than the Ernest soil; on uplands

Similar components:
- Moderately well drained soils that have no root-restricting layer in the subsoil, on similar landforms

Soil Properties and Qualities

Available water capacity: Moderate (about 6.6 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: 20 to 36 inches to fragipan
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 36 inches
Water table kind: Perched
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The root system of some shallow-rooted crops may be damaged by frost action.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.

- Erosion control is needed when pastures are established.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- Soil wetness may limit the use of equipment.

Building sites

- Because of wetness, this soil is poorly suited to building site development.
- Because of the seasonal high water table, the period when excavations can be made is restricted and a higher degree of construction site development and building maintenance may be required.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The limited depth to a fragipan affects the ease of excavation and grading.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: W
Hydric soil: No

14C—Ernest silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)

Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 60 acres

Map Unit Composition

Ernest and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 18 inches—yellowish brown silt loam
18 to 30 inches—yellowish brown silt loam; strong brown masses of oxidized iron and light gray iron depletions
30 to 38 inches—light brownish gray silty clay loam; yellowish brown masses of oxidized iron
38 to 65 inches—light brownish gray loam; yellowish brown masses of oxidized iron

Minor Components

Dissimilar components:
- Hayter, Tate, and Tumbling soils, which are well drained and do not have fragipans; in similar areas
- Macove soils, which are well drained, do not have fragipans, and have more rock fragments in the subsoil than the Ernest soil; in similar areas
- Berks and Faywood soils, which are well drained and shallower to bedrock than the Ernest soil; on uplands
- Lobdell soils, which are moderately well drained; on floodplains
- Atkins soils, which are poorly drained; on floodplains
- Weikert soils, which are well drained and shallower to bedrock than the Ernest soil; on uplands

Similar components:
- Moderately well drained soils that have no root-restricting layer in the subsoil, on similar landforms

Soil Properties and Qualities

Available water capacity: Moderate (about 6.6 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: 20 to 36 inches to fragipan
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 36 inches
Water table kind: Perched
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The root system of some shallow-rooted crops may be damaged by frost action.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Poorly suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- Soil wetness may limit the use of equipment.

Building sites

- Because of wetness, this soil is poorly suited to building site development.
- Because of the seasonal high water table, the period when excavations can be made is restricted and a higher degree of construction site development and building maintenance may be required.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The limited depth to a fragipan affects the ease of excavation and grading.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: W
Hydric soil: No

15C—Faywood silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Dominantly summits and shoulders; backslopes in some areas
Size of areas: 2 to 10 acres

Map Unit Composition

Faywood and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam

Subsoil:
4 to 17 inches—dark yellowish brown silty clay
17 to 28 inches—yellowish brown silty clay loam

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Ernest soils, which are moderately well drained and deeper to bedrock than the Faywood soil; on colluvial footslopes
- Rock outcrops in similar areas
- Soils that have many flagstones on the surface layer, in similar areas
- Westmoreland soils, which have less clay in the subsoil and are deeper to bedrock than the Faywood soil; in similar areas

Similar components:
- Hagerstown soils, which are deeper to bedrock than the Faywood soil; in similar areas

- Opequon soils, which are shallower to bedrock than the Faywood soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.2 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; poorly suited to alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Bedrock may interfere with the construction of haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: U
Hydric soil: No

15D—Faywood silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 10 acres

Map Unit Composition

Faywood and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam

Subsoil:
4 to 17 inches—dark yellowish brown silty clay
17 to 28 inches—yellowish brown silty clay loam

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Ernest soils, which are moderately well drained and deeper to bedrock than the Faywood soil; on colluvial footslopes
- Rock outcrops in similar areas
- Soils that have many flagstones on the surface, in similar areas
- Westmoreland soils, which have less clay in the subsoil and are deeper to bedrock than the Faywood soil; in similar areas

Similar components:
- Hagerstown soils, which are deeper to bedrock than the Faywood soil; in similar areas
- Opequon soils, which are shallower to bedrock than the Faywood soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.2 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; poorly suited to alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.

- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: U
Hydric soil: No

15E—Faywood silt loam, 25 to 60 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 10 acres

Map Unit Composition

Faywood and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam

Subsoil:
4 to 17 inches—dark yellowish brown silty clay
17 to 28 inches—yellowish brown silty clay loam

Hard bedrock:
28 inches—limestone bedrock

Minor Components

Dissimilar components:
- Ernest soils, which are moderately well drained and deeper to bedrock than the Faywood soil; on colluvial footslopes
- Rock outcrops in similar areas
- Soils that have many flagstones on the surface, in similar areas
- Westmoreland soils, which have less clay in the subsoil and are deeper to bedrock than the Faywood soil; in similar areas

Similar components:
- Hagerstown soils, which are deeper to bedrock than the Faywood soil; in similar areas
- Opequon soils, which are shallower to bedrock than the Faywood soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.2 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: U
Hydric soil: No

16B—Frederick silt loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits and shoulders
Size of areas: 2 to 25 acres

Map Unit Composition

Frederick and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 25 inches—yellowish red clay; brownish yellow mottles
25 to 42 inches—yellowish red silty clay; brownish yellow and red mottles and black manganese masses
42 to 70 inches—yellowish red silty clay; red and brownish yellow mottles and black manganese masses

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Westmoreland soils, which have less clay in the subsoil and are shallower to bedrock than the Frederick soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Frederick soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Rock outcrops and shallower soils in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Frederick soil; on footslopes

- Shottower soils, which have rounded cobbles; on high stream terraces
- Groseclose soils, which have siltier textures in the lower part of the subsoil than the Frederick soil; in similar areas
- Hagerstown soils, which are shallower to bedrock than the Frederick soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that have more rock fragments in the surface layer than the Frederick soil

Soil Properties and Qualities

Available water capacity: Moderate (about 8.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: M
Hydric soil: No

16C—Frederick silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands (fig. 5)
Position on the landform: Summits and shoulders
Size of areas: 2 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 25 inches—yellowish red clay; brownish yellow mottles
25 to 42 inches—yellowish red silty clay; brownish yellow and red mottles and black manganese masses
42 to 70 inches—yellowish red silty clay; red and brownish yellow mottles and black manganese masses

Minor Components

Dissimilar components:

- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Westmoreland soils, which have less clay in the subsoil and are shallower to bedrock than the Frederick soil; in similar areas

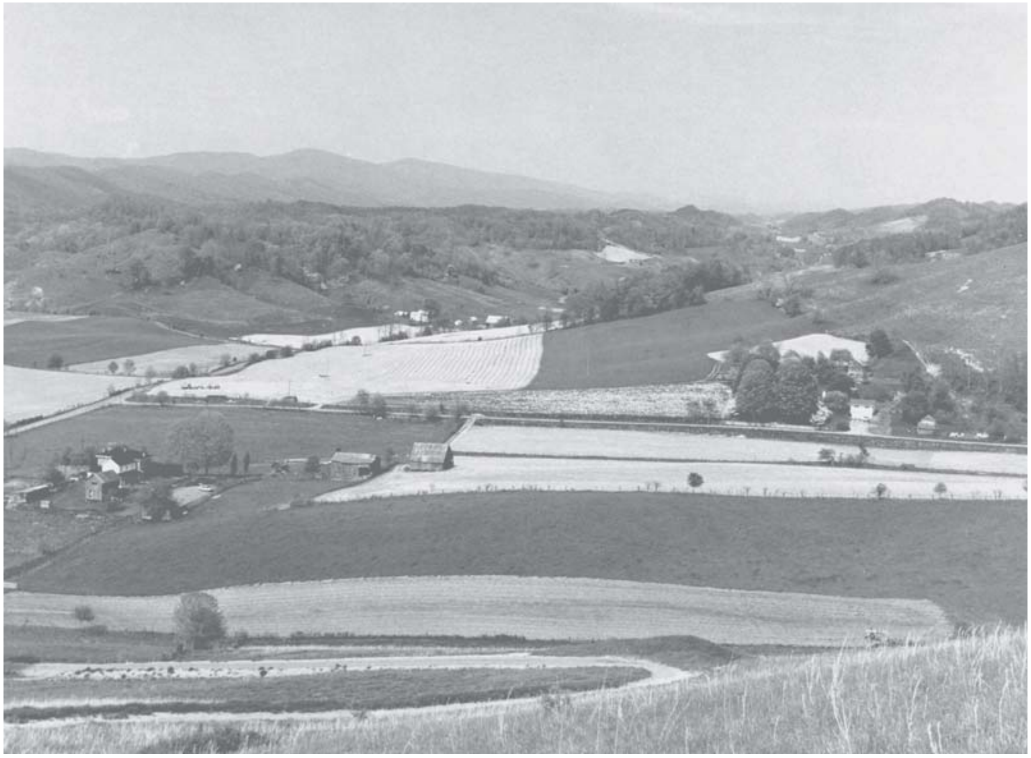

Figure 5.—Farmstead and cropfields in Rich Valley on Frederick silt loam, 7 to 15 percent slopes, and Wyrick-Marbie complex, 7 to 15 percent slopes. The steep pasture is on Frederick silt loam, 25 to 45 percent slopes, and Westmoreland silt loam, 25 to 50 percent slopes, rocky. The woodland on the mountains is on Dekalb channery loam, 25 to 60 percent slopes, and Lily loam, 25 to 65 percent slopes, very stony.

- Timberville soils, which are darker and have thicker surface horizons than the Frederick soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Rock outcrops and shallower soils, in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Frederick soil; on footslopes
- Shottower soils, which have rounded cobbles; on high stream terraces
- Groseclose soils, which have siltier textures in the lower part of the subsoil than the Frederick soil; in similar areas
- Hagerstown soils, which are shallower to bedrock than the Frederick soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that have more rock fragments in the surface layer than the Frederick soil

Soil Properties and Qualities

Available water capacity: Moderate (about 8.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- These soil is well suited to equipment operations.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: M
Hydric soil: No

16D—Frederick silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 25 inches—yellowish red clay; brownish yellow mottles
25 to 42 inches—yellowish red silty clay; brownish yellow and red mottles and black manganese masses
42 to 70 inches—yellowish red silty clay; red and brownish yellow mottles and black manganese masses

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Westmoreland soils, which have less clay in the subsoil and are shallower to bedrock than the Frederick soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Frederick soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Rock outcrops and shallower soils, in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Frederick soil; on footslopes

- Shottower soils, which have rounded cobbles; on high stream terraces
- Groseclose soils, which have siltier textures in the lower part of the subsoil than the Frederick soil; in similar areas
- Hagerstown soils, which are shallower to bedrock than the Frederick soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that have more rock fragments in the surface layer than the Frederick soil

Soil Properties and Qualities

Available water capacity: Moderate (about 8.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion.

- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: M
Hydric soil: No

16E—Frederick silt loam, 25 to 45 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands (fig. 6)
Position on the landform: Backslopes
Size of areas: 2 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 25 inches—yellowish red clay; brownish yellow mottles
25 to 42 inches—yellowish red silty clay; brownish yellow and red mottles and black manganese masses

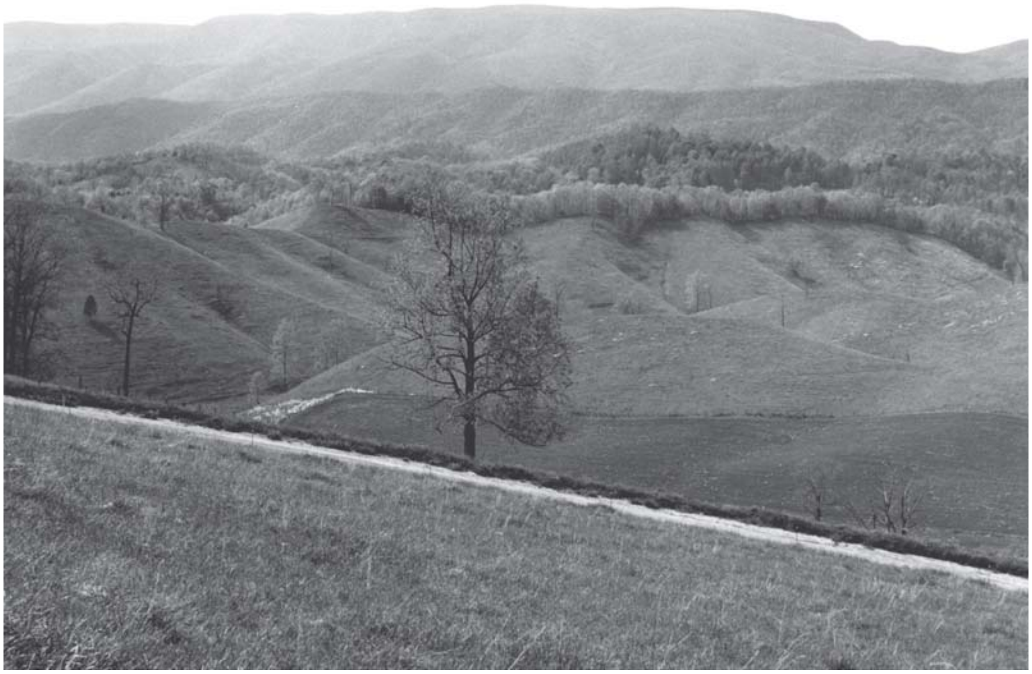

Figure 6.—Frederick silt loam, 25 to 45 percent slopes, is in the steep area in the foreground. Westmoreland silt loam, 25 to 50 percent slopes, rocky, is in the middle ground. The wooded areas in the background are on Dekalb channery loam, 25 to 60 percent slopes, and Lily loam, 25 to 65 percent slopes, very stony.

42 to 70 inches—yellowish red silty clay; red and brownish yellow mottles and black manganese masses

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Westmoreland soils, which have less clay in the subsoil and are shallower to bedrock than the Frederick soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Frederick soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Rock outcrops and shallower soils, in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Frederick soil; on footslopes
- Shottower soils, which have rounded cobbles; on high stream terraces
- Groseclose soils, which have siltier textures in the lower part of the subsoil than the Frederick soil; in similar areas
- Hagerstown soils, which are shallower to bedrock than the Frederick soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that have more rock fragments in the surface layer than the Frederick soil

Soil Properties and Qualities

Available water capacity: Moderate (about 8.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Figure 7.—Frederick very gravelly silt loam, 7 to 15 percent slopes, is in the foreground. The pasture is in an area of Hagerstown silt loam, 15 to 25 percent slopes, very rocky. The woods in the background are in an area of Lily loam, 25 to 65 percent slopes, very stony.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: M
Hydric soil: No

17C—Frederick very gravelly silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands (fig. 7)
Position on the landform: Summits and shoulders
Size of areas: 2 to 50 acres

Map Unit Composition

Frederick and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown very gravelly silt loam

Subsoil:
9 to 25 inches—yellowish red clay
25 to 70 inches—yellowish red silty clay

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Westmoreland soils, which have less clay in the subsoil and are shallower to bedrock than the Frederick soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Frederick soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Rock outcrops and shallower soils, in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Frederick soil; on footslopes
- Shottower soils, which have rounded cobbles; on high stream terraces
- Groseclose soils, which have siltier textures in the lower part of the subsoil than the Frederick soil; in similar areas
- Hagerstown soils, which are shallower to bedrock than the Frederick soil; in similar areas
- Watahala soils, which have more chert in the upper part than the Frederick soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that have fewer rock fragments in the surface layer than the Frederick soil

Soil Properties and Qualities

Available water capacity: Moderate (about 7.7 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4s
Virginia soil management group: M
Hydric soil: No

17D—Frederick very gravelly silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 50 acres

Map Unit Composition

Frederick and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown very gravelly silt loam

Subsoil:
9 to 25 inches—yellowish red clay
25 to 70 inches—yellowish red silty clay

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Westmoreland soils, which have less clay in the subsoil and are shallower to bedrock than the Frederick soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Frederick soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Rock outcrops and shallower soils, in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Frederick soil; on footslopes
- Shottower soils, which have rounded cobbles; on high stream terraces
- Groseclose soils, which have siltier textures in the lower part of the subsoil than the Frederick soil; in similar areas
- Hagerstown soils, which are shallower to bedrock than the Frederick soil; in similar areas
- Watahala soils, which have more chert in the upper part than the Frederick soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that have fewer rock fragments in the surface layer than the Frederick soil

Soil Properties and Qualities

Available water capacity: Moderate (about 7.7 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate

Runoff class: High
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: M
Hydric soil: No

17E—Frederick very gravelly silt loam, 25 to 45 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 100 acres

Map Unit Composition

Frederick and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—dark yellowish brown very gravelly silt loam

Subsoil:
9 to 25 inches—yellowish red clay
25 to 70 inches—yellowish red silty clay

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Westmoreland soils, which have less clay in the subsoil and are shallower to bedrock than the Frederick soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Frederick soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Rock outcrops and shallower soils, in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Frederick soil; on footslopes
- Shottower soils, which have rounded cobbles; on high stream terraces
- Groseclose soils, which have siltier textures in the lower part of the subsoil than the Frederick soil; in similar areas
- Hagerstown soils, which are shallower to bedrock than the Frederick soil; in similar areas
- Watahala soils, which have more chert in the upper part than the Frederick soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that have fewer rock fragments in the surface layer than the Frederick soil

Soil Properties and Qualities

Available water capacity: Moderate (about 7.7 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)

Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: About 0.5 to 2.0 percent coarse angular gravel
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: M
Hydric soil: No

18D—Greenlee very cobbly loam, 7 to 35 percent slopes, very stony

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes
Size of areas: Less than 5 acres

Map Unit Composition

Greenlee and similar soils: Typically 85 percent; ranging from about 80 to 95 percent

Typical Profile

Organic layer:
0 to 2 inches—moderately decomposed plant material

Surface layer:
2 to 7 inches—dark brown very cobbly loam
7 to 14 inches—dark yellowish brown very cobbly sandy loam

Subsoil:
14 to 53 inches—yellowish brown very cobbly sandy loam

Substratum:
53 to 62 inches—yellowish brown extremely cobbly sandy loam

Minor Components

Dissimilar components:
- Konnarock soils, which are shallower to bedrock than the Greenlee soil; on uplands
- Pigeonroost soils, which are shallower to bedrock and have fewer rock fragments than the Greenlee soil; on uplands

Similar components:
- Tate soils, which have fewer rock fragments in the soil and on the surface than the Greenlee soil; on similar landforms

Soil Properties and Qualities

Available water capacity: Low (about 5.5 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None

Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 0.1 to 3.0 percent subrounded stones
Parent material: Colluvium derived from rhyolite

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to yellow-poplar and eastern white pine; moderately suited to northern red oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the moderate content of rock fragments, excavation may be difficult and cutbanks may become unstable; excavations and trench walls may require reinforcement.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7s
Virginia soil management group: CC
Hydric soil: No

19C—Hagerstown-Rock outcrop complex, 2 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 50 acres

Map Unit Composition

Note: The Hagerstown soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Hagerstown and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Rock outcrop: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Hagerstown

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. The outcrops are a few inches to about 5 feet tall.

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagerstown soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Hagerstown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagerstown soil; in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Hagerstown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagerstown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagerstown soil; in similar areas

- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagerstown soil; in similar areas

Properties and Qualities of the Hagerstown Soil

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pasture

- This map unit is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This map unit is well suited to haul roads and log landings.
- This map unit is well suited to equipment operations.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, the Hagerstown soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength of the Hagerstown soil is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Hagerstown—7s; Rock outcrop—8s
Virginia soil management group: Hagerstown—M; Rock outcrop—none assigned
Hydric soils: No

19E—Hagerstown-Rock outcrop complex, 15 to 45 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Dominantly backslopes; some areas on summits and shoulders
Size of areas: 2 to 50 acres

Map Unit Composition

Note: The Hagerstown soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Hagerstown and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Rock outcrop: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Hagerstown

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. The outcrops are a few inches to about 5 feet tall.

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagerstown soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Hagerstown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagerstown soil; in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Hagerstown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagerstown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagerstown soil; in similar areas

Properties and Qualities of the Hagerstown Soil

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pasture

- This map unit is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, the Hagerstown soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength of the Hagerstown soil is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Hagerstown—7s; Rock outcrop—8s
Virginia soil management group: Hagerstown—M; Rock outcrop—none assigned
Hydric soils: No

20C—Hagerstown silt loam, 7 to 15 percent slopes, very rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits and shoulders
Size of areas: 2 to 25 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 2 to 10 percent of the surface.

Hagerstown and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagerstown soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Hagerstown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagerstown soil; in similar areas

Similar components:
- Shottower soils, which have rounded cobbles and are deeper to bedrock than the Hagerstown soil; on high stream terraces
- Wyrick soils, which have less clay in the subsoil than the Hagerstown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagerstown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagerstown soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)

Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: M
Hydric soil: No

20D—Hagerstown silt loam, 15 to 25 percent slopes, very rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 50 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 2 to 10 percent of the surface.

Hagerstown and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Minor Components

Dissimilar components:

- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagerstown soil; in similar areas

- Timberville soils, which are darker and have thicker surface horizons than the Hagerstown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagerstown soil; in similar areas

Similar components:
- Shottower soils, which have rounded cobbles and are deeper to bedrock than the Hagerstown soil; on high stream terraces
- Wyrick soils, which have less clay in the subsoil than the Hagerstown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagerstown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagerstown soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.

- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: M
Hydric soil: No

20E—Hagerstown silt loam, 25 to 45 percent slopes, very rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 50 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 2 to 10 percent of the surface.

Hagerstown and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagertown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagertown soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Hagertown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagertown soil; in similar areas

Similar components:
- Shottower soils, which have rounded cobbles and are deeper to bedrock than the Hagertown soil; on high stream terraces
- Wyrick soils, which have less clay in the subsoil than the Hagertown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagertown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagertown soil; in similar areas
- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagertown soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: M
Hydric soil: No

21D—Hagerstown-Rock outcrop complex, karst, 7 to 45 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on karst uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 50 acres
Note: Many sinkholes are scattered throughout this map unit

Map Unit Composition

Note: The Hagerstown soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Hagerstown and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Rock outcrop: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Hagerstown

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. The outcrops are a few inches to about 5 feet tall.

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagertown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagertown soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the

Hagertown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagertown soil; in similar areas

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Hagertown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagertown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagertown soil; in similar areas
- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagerstown soil; in similar areas

Properties and Qualities of the Hagerstown Soil

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pasture

- This map unit is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- Because of the potential for sinkhole collapse, building site development in karst areas is not recommended.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Septic tank absorption fields should not be located near sinkholes.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, the Hagerstown soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Collapsing sinkholes may damage local roads and streets.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Hagerstown—7s; Rock outcrop—8s
Virginia soil management group: Hagerstown—M; Rock outcrop—none assigned
Hydric soils: No

22C—Hagerstown silt loam, karst, 7 to 15 percent slopes, very rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on karst uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: Less than 5 acres
Note: Many sinkholes are scattered throughout this map unit

Map Unit Composition

Note: Outcrops of limestone bedrock cover 2 to 10 percent of the surface.

Hagerstown and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagerstown soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Hagerstown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagerstown soil; in similar areas

Similar components:
- Shottower soils, which have rounded cobbles and are deeper to bedrock than the Hagerstown soil; in similar areas
- Wyrick soils, which have less clay in the subsoil than the Hagerstown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagerstown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagerstown soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- In karst areas, using best management practices reduces the potential for ground-water pollution.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- Because of the potential for sinkhole collapse, building site development in karst areas is not recommended.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Septic tank absorption fields should not be located near sinkholes.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Collapsing sinkholes may damage local roads and streets.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: M
Hydric soil: No

22D—Hagerstown silt loam, karst, 15 to 25 percent slopes, very rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on karst uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 100 acres
Note: Many sinkholes are scattered throughout this map unit

Map Unit Composition

Note: Outcrops of limestone bedrock cover 2 to 10 percent of the surface.

Hagerstown and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 50 inches—strong brown silty clay; yellowish red mottles

Hard bedrock:
50 inches—limestone bedrock

Minor Components

Dissimilar components:
- Marbie soils, which have a root-restricting layer in the subsoil; on colluvial footslopes
- Weikert soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Westmoreland soils, which have less clay and more rock fragments in the subsoil than the Hagerstown soil; in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Hagerstown soil and are frequently flooded; in the bottoms of drainageways and sinkholes
- Opequon soils, which are shallower to limestone bedrock than the Hagerstown soil; in similar areas

Similar components:
- Shottower soils, which have rounded cobbles and are deeper to bedrock than the Hagerstown soil; in similar areas

- Wyrick soils, which have less clay in the subsoil than the Hagerstown soil; on colluvial footslopes
- Frederick soils, which are deeper to bedrock than the Hagerstown soil; in similar areas
- Faywood soils, which are shallower to bedrock than the Hagerstown soil; in similar areas
- Litz soils, which are shallower to bedrock and have less clay in the subsoil than the Hagerstown soil; in similar areas
- Soils that have surface layers of silty clay loam or clay loam, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 6.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- In karst areas, using best management practices reduces the potential for ground-water pollution.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- Because of the potential for sinkhole collapse, building site development in karst areas is not recommended.

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Septic tank absorption fields should not be located near sinkholes.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Collapsing sinkholes may damage local roads and streets.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: M
Hydric soil: No

23C—Hayter loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 25 acres

Map Unit Composition

Hayter and similar soils: Typically 75 percent; ranging from about 70 to 80 percent

Typical Profile

Surface layer:
0 to 11 inches—brown loam

Subsoil:
11 to 40 inches—strong brown loam
40 to 65 inches—yellowish brown loam

Minor Components

Dissimilar components:
- Weikert, Litz, and Berks soils, which are shallower to bedrock than the Hayter soil; on uplands
- Marbie and Ernest soils, which have a root-restricting layer in the subsoil; in similar areas
- Clubcaf soils, which are poorly drained; on narrow floodplains
- Timberville soils, which have darker and deeper surface layers than the Hayter soil and are frequently flooded; in drainageways

Similar components:
- Wyrick soils, which have more clay in the subsoil than the Hayter soil; in similar landscape positions
- Westmoreland soils, which have bedrock at a depth of 40 to 60 inches; on uplands

Soil Properties and Qualities

Available water capacity: High (about 9.9 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Colluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to grass-legume hay; moderately suited to corn, tobacco, and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages,

applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: L
Hydric soil: No

23D—Hayter loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes
Size of areas: 2 to 25 acres

Map Unit Composition

Hayter and similar soils: Typically 70 percent; ranging from about 65 to 75 percent

Typical Profile

Surface layer:
0 to 11 inches—brown loam

Subsoil:
11 to 40 inches—strong brown loam
40 to 65 inches—yellowish brown loam

Minor Components

Dissimilar components:
- Weikert, Litz, and Berks soils, which are shallower to bedrock than the Hayter soil; on uplands
- Marbie and Ernest soils, which have a root-restricting layer in the subsoil; in similar areas
- Clubcaf soils, which are poorly drained; on narrow floodplains
- Timberville soils, which have darker and deeper surface layers than the Hayter soil and are frequently flooded; in drainageways

Similar components:
- Wyrick soils, which have more clay in the subsoil than the Hayter soil; in similar landscape positions
- Westmoreland soils, which have bedrock at a depth of 40 to 60 inches; on uplands

Soil Properties and Qualities

Available water capacity: High (about 9.9 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental

benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: L
Hydric soil: No

24B—Ingledove loam, 2 to 7 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Low stream terraces along the North Fork of the Holston River
Position on the landform: Treads
Size of areas: 5 to 75 acres

Map Unit Composition

Ingledove and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 13 inches—dark yellowish brown loam

Subsoil:
13 to 52 inches—strong brown loam; black manganese masses
52 to 65 inches—dark yellowish brown clay loam; pale brown iron-manganese masses, yellowish red masses of oxidized iron, and black manganese masses

Minor Components

Dissimilar components:
- Allegheny soils, which are not susceptible to flooding; on intermediate to high river terraces
- Wolfgap soils, which have a less developed subsoil than the Ingledove soil and are more susceptible to flooding; on floodplains

- Monongahela soils, which are moderately well drained and not susceptible to flooding; on intermediate terraces

Similar components:
- Botetourt soils, which are moderately well drained; in similar areas
- Soils that have gravelly surface layers, in similar areas
- Soils that have silty and sandy subsoils, in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.6 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- Because of flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding and the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: A
Hydric soil: No

25C—Konnarock channery silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Mountains on uplands
Position on the landform: Dominantly summits and shoulders; backslopes in some areas
Size of areas: 2 to 10 acres

Map Unit Composition

Konnarock and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—dark grayish brown channery silt loam

Subsoil:
2 to 13 inches—strong brown very channery loam

Substratum:
13 to 23 inches—brown very channery silt loam

Hard bedrock:
23 inches—bedrock

Minor Components

Dissimilar components:
- Edneytown soils, which are deeper to bedrock and have fewer rock fragments than the Konnarock soil; on uplands
- Greenlee soils, which are deeper to bedrock than the Konnarock soil; on footslopes
- Tate soils, which are deeper to bedrock and have fewer rock fragments than the Konnarock soil; on footslopes

Similar components:
- Lily and Pigeonroost soils, which have fewer rock fragments and a better developed subsoil than the Konnarock soil; in similar areas
- Soils that have more clay in the subsoil and more sand in the substratum than the Konnarock soil, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.0 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from metamorphic and sedimentary rock

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn and tobacco; not suited to alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Moderately suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Bedrock may interfere with the construction of haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4s
Virginia soil management group: JJ
Hydric soil: No

25D—Konnarock channery silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 40 acres

Map Unit Composition

Konnarock and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—dark grayish brown channery silt loam

Subsoil:
2 to 13 inches—strong brown very channery loam

Substratum:
13 to 23 inches—brown very channery silt loam

Hard bedrock:
23 inches—bedrock

Minor Components

Dissimilar components:
- Edneytown soils, which are deeper to bedrock and have fewer rock fragments than the Konnarock soil; on uplands

- Greenlee soils, which are deeper to bedrock than the Konnarock soil; on footslopes
- Tate soils, which are deeper to bedrock and have fewer rock fragments than the Konnarock soil; on footslopes

Similar components:

- Lily and Pigeonroost soils, which have fewer rock fragments and better developed subsoils than the Konnarock soil; in similar areas
- Soils that have more clay in the subsoil and more sand in the substratum than the Konnarock soil, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.0 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from metamorphic and sedimentary rock

Use and Management Considerations

Cropland

Suitability: Poorly suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay

- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Poorly suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: JJ
Hydric soil: No

25E—Konnarock channery silt loam, 25 to 70 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 2 to 200 acres

Map Unit Composition

Konnarock and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—dark grayish brown channery silt loam

Subsoil:
2 to 13 inches—strong brown very channery loam

Substratum:
13 to 23 inches—brown very channery silt loam

Hard bedrock:
23 inches—bedrock

Minor Components

Dissimilar components:
- Edneytown soils, which are deeper to bedrock and have fewer rock fragments than the Konnarock soil; on uplands
- Greenlee soils, which are deeper to bedrock than the Konnarock soil; on footslopes
- Tate soils, which are deeper to bedrock and have fewer rock fragments than the Konnarock soil; on footslopes

Similar components:
- Lily and Pigeonroost soils, which have fewer rock fragments and a better developed subsoil than the Konnarock soil; in similar areas
- Soils that have more clay in the subsoil and more sand in the substratum than the Konnarock soil, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.0 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: None
Parent material: Residuum weathered from metamorphic and sedimentary rock

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.

- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

26B—Lily loam, 2 to 7 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Summits
Size of areas: 5 to 50 acres

Map Unit Composition

Lily and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown loam

Subsoil:
5 to 11 inches—dark yellowish brown clay loam
11 to 24 inches—yellowish brown loam

Hard bedrock:
24 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Tate and Tumbling soils, which are deeper to bedrock than the Lily soil; on colluvial footslopes
- Macove soils, which are deeper to bedrock and have more rock fragments in the subsoil than the Lily soil; in drainageways and on colluvial footslopes
- Rock outcrops in similar areas
- Weikert soils, which are shallower to shale bedrock than the Lily soil; in similar areas
- Drypond soils, which are excessively drained and shallower to sandstone bedrock than the Lily soil; in similar areas

Similar components:
- Dekalb soils, which have more sandstone rock fragments in the subsoil than the Lily soil; in similar areas
- Konnarock soils, which have many tillite rock fragments in the subsoil; in similar areas
- Soils that have gravelly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 3.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: About 0.1 to 3.0 percent subangular stones
Parent material: Fine-loamy residuum weathered from sandstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Bedrock may interfere with the construction of haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: U
Hydric soil: No

26C—Lily loam, 7 to 15 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Summits and shoulders
Size of areas: 5 to 50 acres

Map Unit Composition

Lily and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown loam

Subsoil:
5 to 11 inches—dark yellowish brown clay loam
11 to 24 inches—yellowish brown loam

Hard bedrock:
24 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Tate and Tumbling soils, which are deeper to bedrock than the Lily soil; on colluvial footslopes

- Macove soils, which are deeper to bedrock and have more rock fragments in the subsoil than the Lily soil; in drainageways and on colluvial footslopes
- Rock outcrops in similar areas
- Weikert soils, which are shallower to shale bedrock than the Lily soil; in similar areas
- Drypond soils, which are excessively drained and shallower to sandstone bedrock than the Lily soil; in similar areas

Similar components:
- Dekalb soils, which have more sandstone rock fragments in the subsoil than the Lily soil; in similar areas
- Konnarock soils, which have many tillite rock fragments in the subsoil; in similar areas
- Soils that have gravelly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 3.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: About 0.1 to 3.0 percent subangular stones
Parent material: Fine-loamy residuum weathered from sandstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.

- Bedrock may interfere with the construction of haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: U
Hydric soil: No

26D—Lily loam, 15 to 25 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 250 acres

Map Unit Composition

Lily and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown loam

Subsoil:
5 to 11 inches—dark yellowish brown clay loam
11 to 24 inches—yellowish brown loam

Hard bedrock:
24 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Tate and Tumbling soils, which are deeper to bedrock than the Lily soil; on colluvial footslopes

- Macove soils, which are deeper to bedrock and have more rock fragments in the subsoil than the Lily soil; in drainageways and on colluvial footslopes
- Rock outcrops in similar areas
- Weikert soils, which are shallower to shale bedrock than the Lily soil; in similar areas
- Drypond soils, which are excessively drained and shallower to sandstone bedrock than the Lily soil; in similar areas

Similar components:
- Dekalb soils, which have more sandstone rock fragments in the subsoil than the Lily soil; in similar areas
- Konnarock soils, which have many tillite rock fragments in the subsoil; in similar areas
- Soils that have gravelly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 3.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: About 0.1 to 3.0 percent subangular stones
Parent material: Fine-loamy residuum weathered from sandstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7s
Virginia soil management group: U
Hydric soil: No

26E—Lily loam, 25 to 65 percent slopes, very stony

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 5 to 2,000 acres

Map Unit Composition

Lily and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown loam

Subsoil:
5 to 11 inches—dark yellowish brown clay loam
11 to 24 inches—yellowish brown loam

Hard bedrock:
24 inches—sandstone bedrock

Minor Components

Dissimilar components:
- Tate and Tumbling soils, which are deeper to bedrock than the Lily soil; on colluvial footslopes
- Macove soils, which are deeper to bedrock and have more rock fragments in the subsoil than the Lily soil; in drainageways and on colluvial footslopes
- Rock outcrops in similar areas
- Weikert soils, which are shallower to shale bedrock than the Lily soil; in similar areas
- Drypond soils, which are excessively drained and shallower to sandstone bedrock than the Lily soil; in similar areas

- Elliber soils, which have chert rock fragments on the surface and in the subsoil and are very deep to bedrock; in similar areas at the lower elevations

Similar components:
- Dekalb soils, which have more sandstone rock fragments in the subsoil than the Lily soil; in similar areas
- Konnarock soils, which have many tillite rock fragments in the subsoil; in similar areas
- Soils that have gravelly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 3.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: About 0.1 to 3.0 percent subangular stones
Parent material: Fine-loamy residuum weathered from sandstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: U
Hydric soil: No

27D—Litz silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 15 acres

Map Unit Composition

Litz and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown silt loam

Subsoil:
2 to 13 inches—yellowish brown and strong brown very channery silt loam and silty clay loam

Substratum:
13 to 35 inches—yellowish brown very channery silt loam

Hard bedrock:
35 inches—olive siltstone bedrock

Minor Components

Dissimilar components:
- Hagerstown soils, which have more clay in the subsoil and are deeper to bedrock than the Litz soil; in similar areas
- Hayter soils, which are deeper to bedrock than the Litz soil; on the lower slopes and along drainageways
- Marbie soils, which are moderately well drained; on the lower edges of slopes subject to seepage
- Westmoreland soils, which are deeper to bedrock than the Litz soil; in similar areas
- Opequon soils, which have more clay in the subsoil than the Litz soil; in similar areas

Similar components:
- Weikert soils, which are shallower to bedrock than the Litz soil; in similar areas
- Soils that have surface layers of channery silt loam, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn and tobacco; not suited to alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Poorly suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: JJ
Hydric soil: No

27E—Litz silt loam, 25 to 50 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 200 acres

Map Unit Composition

Litz and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown silt loam

Subsoil:
2 to 13 inches—yellowish brown and strong brown very channery silt loam and silty clay loam

Substratum:
13 to 35 inches—yellowish brown very channery silt loam

Hard bedrock:
35 inches—olive siltstone bedrock

Minor Components

Dissimilar components:
- Hagerstown soils, which have more clay in the subsoil and are deeper to bedrock than the Litz soil; in similar areas
- Hayter soils, which are deeper to bedrock than the Litz soil; on the lower slopes and along drainageways
- Marbie soils, which are moderately well drained; on the lower edges of slopes subject to seepage
- Westmoreland soils, which are deeper to bedrock than the Litz soil; in similar areas
- Opequon soils, which have more clay in the subsoil than the Litz soil; in similar areas

Similar components:
- Weikert soils, which are shallower to bedrock than the Litz soil; in similar areas
- Soils that have surface layers of channery silt loam, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.

- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

27F—Litz silt loam, 50 to 80 percent slopes, very rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 800 acres

Map Unit Composition

Note: Outcrops of shale or limestone bedrock cover 2 to 10 percent of the surface. Rock outcrops range from a few inches tall to 40 feet in height as near-vertical cliffs.

Litz and similar soils: Typically 65 percent; ranging from about 50 to 75 percent

Typical Profile

Surface layer:
0 to 2 inches—dark brown silt loam

Subsoil:
2 to 13 inches—yellowish brown and strong brown very channery silt loam and silty clay loam

Substratum:
13 to 35 inches—yellowish brown very channery silt loam

Hard bedrock:
35 inches—olive siltstone bedrock

Minor Components

Dissimilar components:
- Hagerstown soils, which have more clay in the subsoil and are deeper to bedrock than the Litz soil; in similar areas
- Hayter soils, which are deeper to bedrock than the Litz soil; on the lower slopes and along drainageways
- Marbie soils, which are moderately well drained; on the lower edges of slopes subject to seepage
- Westmoreland soils, which are deeper to bedrock than the Litz soil; in similar areas
- Opequon soils, which have more clay in the subsoil than the Litz soil; in similar areas

Similar components:
- Weikert soils, which are shallower to bedrock than the Litz soil; in similar areas
- Soils that have surface layers of channery silt loam, in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 2.9 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.

- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

28C—Litz-Groseclose complex, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Dominantly summits and shoulders; backslopes in some areas
Size of areas: 2 to 30 acres

Map Unit Composition

Note: The Litz and Groseclose soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Litz and similar soils: Typically 50 percent; ranging from about 45 to 55 percent
Groseclose and similar soils: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Litz

Surface layer:
0 to 2 inches—dark brown silt loam

Subsoil:
2 to 13 inches—yellowish brown and strong brown very channery silt loam and silty clay loam

Substratum:
13 to 35 inches—yellowish brown very channery silt loam

Hard bedrock:
35 inches—olive siltstone bedrock

Groseclose

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

Subsoil:
6 to 43 inches—yellowish brown clay

Substratum:
43 to 65 inches—brownish yellow clay loam

Minor Components

Dissimilar components:
- Opequon soils, which are shallower to limestone bedrock than the Litz and Groseclose soils; in similar areas
- Rock outcrops in similar areas
- Marbie soils, which are moderately well drained; on the lower edges of slopes that are subject to ground-water seepage
- Wyrick soils, which are deeper to bedrock and have fewer rock fragments than the Litz soil and have less clay than Groseclose soil; on footslopes and along the lower edges of backslopes
- Weikert soils, which are shallower to shale bedrock than the Litz and Groseclose soils; in similar areas

Similar components:
- Tumbling soils, which are deeper to bedrock than the Litz soil and have less clay than the Groseclose soil; in similar areas
- Westmoreland soils, which have fewer rock fragments than the Litz soil and less clay than the Groseclose soil; in similar areas
- Soils that have surface layers of channery silt loam, in similar areas

Soil Properties and Qualities

Available water capacity: Litz—very low (about 2.9 inches); Groseclose—moderate (about 7.9 inches)
Slowest saturated hydraulic conductivity: Litz—moderately high (about 0.6 in/hr); Groseclose—moderately low (about 0.06 in/hr)
Depth class: Litz—moderately deep (20 to 40 inches); Groseclose—very deep (more than 60 inches)
Depth to root-restrictive feature: Litz—20 to 40 inches to bedrock (lithic); Groseclose—none
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Litz—low; Groseclose—high
Runoff class: Litz—medium; Groseclose—high
Surface fragments: None
Parent material: Litz—residuum weathered from limestone and shale; Groseclose—clayey residuum weathered from limestone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn and tobacco; not suited to alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Poorly suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak, chestnut oak, and eastern white pine

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Bedrock may interfere with the construction of haul roads and log landings.
- These soils are well suited to equipment operations.

Building sites

- The severe shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: Litz—JJ; Groseclose—M
Hydric soils: No

28D—Litz-Groseclose complex, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 70 acres

Map Unit Composition

Note: The Litz and Groseclose occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Litz and similar soils: Typically 50 percent; ranging from about 45 to 55 percent
Groseclose and similar soils: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Litz

Surface layer:
0 to 2 inches—dark brown silt loam

Subsoil:
2 to 13 inches—yellowish brown and strong brown very channery silt loam and silty clay loam

Substratum:
13 to 35 inches—yellowish brown very channery silt loam

Hard bedrock:
35 inches—olive siltstone bedrock

Groseclose

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

Subsoil:
6 to 43 inches—yellowish brown clay

Substratum:
43 to 65 inches—brownish yellow clay loam

Minor Components

Dissimilar components:
- Opequon soils, which are shallower to limestone bedrock than the Litz and Groseclose soils; in similar areas
- Rock outcrops in similar areas
- Marbie soils, which are moderately well drained; on the lower edges of slopes that are subject to ground-water seepage
- Wyrick soils, which are deeper to bedrock and have fewer rock fragments than the Litz soil and have less clay than the Groseclose soil; on footslopes and along the lower edges of backslopes
- Weikert soils, which are shallower to shale bedrock than the Litz and Groseclose soils; in similar areas

Similar components:
- Tumbling soils, which are deeper to bedrock than the Litz soil and have less clay than Groseclose soil; in similar areas
- Westmoreland soils, which have fewer rock fragments than the Litz soil and less clay than the Groseclose soil; in similar areas
- Soils that have surface layers of channery silt loam, in similar areas

Soil Properties and Qualities

Available water capacity: Litz—very low (about 2.9 inches); Groseclose—moderate (about 7.9 inches)
Slowest saturated hydraulic conductivity: Litz—moderately high (about 0.6 in/hr); Groseclose—moderately low (about 0.06 in/hr)
Depth class: Litz—moderately deep (20 to 40 inches); Groseclose—very deep (more than 60 inches)
Depth to root-restrictive feature: Litz—20 to 40 inches to bedrock (lithic); Groseclose—none
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Litz—low; Groseclose—high
Runoff class: Litz—high; Groseclose—very high
Surface fragments: None

Parent material: Litz—residuum weathered from limestone and shale; Groseclose—clayey residuum weathered from limestone and shale

Use and Management Considerations

Cropland

Suitability: Poorly suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay

- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.

Pasture

Suitability: Poorly suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak, chestnut oak, and eastern white pine

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The severe shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: Litz—JJ; Groseclose—M
Hydric soils: No

28E—Litz-Groseclose complex, 25 to 75 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 250 acres

Map Unit Composition

Note: The Litz and Groseclose soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Litz and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Groseclose and similar soils: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Litz

Surface layer:
0 to 2 inches—dark brown silt loam

Subsoil:
2 to 13 inches—yellowish brown and strong brown very channery silt loam and silty clay loam

Substratum:
13 to 35 inches—yellowish brown very channery silt loam

Hard bedrock:
35 inches—olive siltstone bedrock

Groseclose

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

Subsoil:
6 to 43 inches—yellowish brown clay

Substratum:
43 to 65 inches—brownish yellow clay loam

Minor Components

Dissimilar components:
- Opequon soils, which are shallower to limestone bedrock than the Litz and Groseclose soils; in similar areas
- Rock outcrops in similar areas
- Marbie soils, which are moderately well drained; on the lower edges of slopes that are subject to ground-water seepage
- Wyrick soils, which are deeper to bedrock and have fewer rock fragments than the Litz soil and have less clay than the Groseclose soil; on footslopes and along the lower edges of backslopes
- Weikert soils, which are shallower to shale bedrock than the Litz and Groseclose soils; in similar areas

Similar components:
- Tumbling soils, which are deeper to bedrock than the Litz soil and have less clay than the Groseclose soil; in similar areas
- Westmoreland soils, which have fewer rock fragments than the Litz soil and less clay than the Groseclose soil; in similar areas
- Soils that have surface layers of channery silt loam, in similar areas

Soil Properties and Qualities

Available water capacity: Litz—very low (about 2.9 inches); Groseclose—moderate (about 7.9 inches)
Slowest saturated hydraulic conductivity: Litz—moderately high (about 0.6 in/hr); Groseclose—moderately low (about 0.06 in/hr)
Depth class: Litz—moderately deep (20 to 40 inches); Groseclose—very deep (more than 60 inches)
Depth to root-restrictive feature: Litz—20 to 40 inches to bedrock (lithic); Groseclose—none
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Litz—low; Groseclose—high
Runoff class: High
Surface fragments: None

Parent material: Litz—residuum weathered from limestone and shale; Groseclose—clayey residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- These soils are unsuited to cropland.

Pasture

- These soils are unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak, chestnut oak, and eastern white pine

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The severe shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, these soils are unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the depth to bedrock, the ease of excavation is reduced and the difficulty of constructing roads in increased.
- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: Litz—JJ; Groseclose—M
Hydric soils: No

29A—Lobdell loam, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Floodplains along small creeks
Position on the landform: Floodplain steps
Size of areas: 2 to 25 acres

Map Unit Composition

Lobdell and similar soils: Typically 75 percent; ranging from about 65 to 85 percent

Typical Profile

Surface layer:
0 to 9 inches—dark brown loam

Subsoil:
9 to 23 inches—yellowish brown loam
23 to 39 inches—dark yellowish brown silt loam; light brownish gray iron depletions

Substratum:
39 to 65 inches—gray loam

Minor Components

Dissimilar components:
- Ernest soils, which have a dense subsoil layer; on colluvial footslopes and toeslopes
- Soils that have stony surfaces, in similar areas
- Atkins soils, which are poorly drained; in similar areas that are slightly lower in elevation

Similar components:
- Wolfgap soils, which are well drained; in similar areas
- Soils that are somewhat poorly drained, in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.5 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 24 to 42 inches
Water table kind: Apparent
Flooding hazard: Occasional
Ponding hazard: None

Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Fine-loamy alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn and grass-legume hay; poorly suited to tobacco; not suited to alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- The root system of some shallow-rooted crops may be damaged by frost action.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.

Woodland

Suitability: Moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should focus on streamside management zones and stream crossings and should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- Because of flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2w
Virginia soil management group: G
Hydric soil: No

Figure 8.—An area of Macove cobbly silt loam, 7 to 15 percent slopes, rubbly. Lily loam, 25 to 65 percent slopes, very stony, is in the background.

30C—Macove cobbly silt loam, 7 to 15 percent slopes, rubbly

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas in valleys (fig. 8)
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 50 acres

Map Unit Composition

Macove and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown cobbly silt loam

Subsurface layer:
6 to 13 inches—dark yellowish brown cobbly silt loam

Subsoil:
13 to 31 inches—reddish brown very cobbly silty clay loam
31 to 65 inches—reddish brown very stony loam

Minor Components

Dissimilar components:
- Weikert, Calvin, Drypond, and Dekalb soils, which are shallower to bedrock than the Macove soil; on uplands
- Lily soils, which have fewer rock fragments and are shallower to bedrock than the Macove soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Tumbling soils, which have fewer rock fragments and more clay in the subsoil than the Macove soil; in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.1 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: About 15 to 50 percent rounded boulders
Parent material: Colluvium derived from sandstone and siltstone and/or colluvium derived from quartzite

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The high content of stones or boulders on the surface may obstruct the construction of haul roads and log landings.
- The amount of rock fragments on the surface may reduce the traction of wheeled harvest equipment.
- Because of rock fragments on the surface, this soil is unsuited to mechanical site preparation for planting.

- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7s
Virginia soil management group: CC
Hydric soil: No

30D—Macove cobbly silt loam, 15 to 25 percent slopes, rubbly

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes
Size of areas: 2 to 100 acres

Map Unit Composition

Macove and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown cobbly silt loam

Subsurface layer:
6 to 13 inches—dark yellowish brown cobbly silt loam

Subsoil:
13 to 31 inches—reddish brown very cobbly silty clay loam
31 to 65 inches—reddish brown very stony loam

Minor Components

Dissimilar components:
- Weikert, Calvin, Drypond, and Dekalb soils, which are shallower to bedrock than the Macove soil; on uplands
- Lily soils, which have fewer rock fragments and are shallower to bedrock than the Macove soil; on uplands
- Atkins soils, which are poorly drained; on floodplains

- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Tumbling soils, which have fewer rock fragments and more clay in the subsoil than the Macove soil; in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.1 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 15 to 50 percent rounded boulders
Parent material: Colluvium derived from sandstone and siltstone and/or colluvium derived from quartzite

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The high content of stones or boulders on the surface may obstruct the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.
- The amount of rock fragments on the surface may reduce the traction of wheeled harvest equipment.
- Because of rock fragments on the surface, this soil is unsuited to mechanical site preparation for planting.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7s
Virginia soil management group: CC
Hydric soil: No

30E—Macove cobbly silt loam, 25 to 50 percent slopes, rubbly

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas on mountains
Position on the landform: Dominantly footslopes; lower backslopes in some areas
Size of areas: 2 to 100 acres

Map Unit Composition

Macove and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown cobbly silt loam

Subsurface layer:
6 to 13 inches—dark yellowish brown cobbly silt loam

Subsoil:
13 to 31 inches—reddish brown very cobbly silty clay loam
31 to 65 inches—reddish brown very stony loam

Minor Components

Dissimilar components:
- Weikert, Calvin, Drypond, and Dekalb soils, which are shallower to bedrock than the Macove soil; on uplands
- Lily soils, which have fewer rock fragments and are shallower to bedrock than the Macove soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Tumbling soils, which have fewer rock fragments and more clay in the subsoil than the Macove soil; in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.1 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 15 to 50 percent rounded boulders
Parent material: Colluvium derived from sandstone and siltstone and/or colluvium derived from quartzite

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The high content of stones or boulders on the surface may obstruct the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- The amount of rock fragments on the surface may reduce the traction of wheeled harvest equipment.
- Because of rock fragments on the surface, this soil is unsuited to mechanical site preparation for planting.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: CC
Hydric soil: No

31C—Macove very channery silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 30 acres

Map Unit Composition

Macove and similar soils: Typically 75 percent; ranging from about 70 to 80 percent

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown very channery silt loam

Subsurface layer:
6 to 13 inches—dark yellowish brown channery silt loam

Subsoil:
13 to 31 inches—reddish brown very channery silty clay loam
31 to 65 inches—reddish brown very channery loam

Minor Components

Dissimilar components:
- Weikert, Calvin, Drypond, and Dekalb soils, which are shallower to bedrock than the Macove soil; on uplands
- Lily soils, which have fewer rock fragments and are shallower to bedrock than the Macove soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Tumbling soils, which have fewer rock fragments and more clay in the subsoil than the Macove soil; in similar areas
- Areas that have slopes of less than 7 percent

Soil Properties and Qualities

Available water capacity: Low (about 5.6 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Colluvium derived from sandstone and siltstone and/or colluvium derived from quartzite

Use and Management Considerations

Cropland

Suitability: Poorly suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4s
Virginia soil management group: CC
Hydric soil: No

31D—Macove very channery silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes
Size of areas: 2 to 70 acres

Map Unit Composition

Macove and similar soils: Typically 75 percent; ranging from about 70 to 80 percent

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown very channery silt loam

Subsurface layer:
6 to 13 inches—dark yellowish brown channery silt loam

Subsoil:
13 to 31 inches—reddish brown very channery silty clay loam
31 to 65 inches—reddish brown very channery loam

Minor Components

Dissimilar components:
- Weikert, Calvin, Drypond, and Dekalb soils, which are shallower to bedrock than the Macove soil; on uplands
- Lily soils, which have fewer rock fragments and are shallower to bedrock than the Macove soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Tumbling soils, which have fewer rock fragments and more clay in the subsoil than the Macove soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.6 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None

Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from sandstone and siltstone and/or colluvium derived from quartzite

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: CC
Hydric soil: No

31E—Macove very channery silt loam, 25 to 50 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas on mountains
Position on the landform: Dominantly footslopes; lower backslopes in some areas
Size of areas: 2 to 170 acres

Map Unit Composition

Macove and similar soils: Typically 75 percent; ranging from about 70 to 80 percent

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown very channery silt loam

Subsurface layer:
6 to 13 inches—dark yellowish brown channery silt loam

Subsoil:
13 to 31 inches—reddish brown very channery silty clay loam
31 to 65 inches—reddish brown very channery loam

Minor Components

Dissimilar components:
- Weikert, Calvin, Drypond, and Dekalb soils, which are shallower to bedrock than the Macove soil; on uplands
- Lily soils, which have fewer rock fragments and are shallower to bedrock than the Macove soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Tumbling soils, which have fewer rock fragments and more clay in the subsoil than the Macove soil; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.6 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from sandstone and siltstone and/or colluvium derived from quartzite

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: CC
Hydric soil: No

32A—Maurertown silt loam, 0 to 2 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Low stream terraces in river valleys
Position on the landform: Treads and backswamps
Size of areas: 2 to 50 acres

Map Unit Composition

Maurertown and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 7 inches—gray silt loam

Subsoil:
7 to 42 inches—gray silty clay loam; yellowish brown masses of oxidized iron
42 to 65 inches—light brownish gray silty clay loam; yellowish brown masses of oxidized iron

Minor Components

Dissimilar components:
- Hayter and Wyrick soils, which are well drained; on colluvial footslopes and fans

Similar components:
- Mongle soils, which are somewhat poorly drained; in similar areas
- Soils that have sandy or gravelly subsoils, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.9 inches)
Slowest saturated hydraulic conductivity: Low (about 0.001 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Poorly drained
Depth to seasonal water saturation: About 0 to 6 inches
Water table kind: Apparent
Flooding hazard: Rare
Ponding hazard: Occasional
Depth of ponding: 0.3 to 1.0 foot
Shrink-swell potential: High
Runoff class: Negligible
Surface fragments: None
Parent material: Clayey alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Poorly suited to corn; not suited to tobacco, grass-legume hay, and alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The root system of some shallow-rooted crops may be damaged by frost action.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Poorly suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Vegetation is limited to species that can tolerate wetness and poor drainage.
- Restricting access during wet periods can minimize compaction.
- To minimize the potential of ground-water pollution, pesticides and fertilizers should not be applied to poorly and very poorly drained soils; mechanical control of undesirable vegetation and deferred grazing are recommended.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.

Woodland

Suitability: Well suited to sweetgum

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- This soil is well suited to haul roads and log landings.
- Soil wetness may limit the use of equipment.

Building sites

- Flooding may result in physical damage and costly repairs to buildings. This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.
- Because of ponding, this soil is unsuited to building site development.
- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed.

Septic tank absorption fields

- This soil is unsuited to septic tank absorption fields because of the flooding and ponding.
- The rare flooding limits the absorption and proper treatment of effluent from septic systems, and rapidly moving floodwaters may damage some components of septic systems.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength of the soil is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4w
Virginia soil management group: NN
Hydric soil: Yes

33A—Mongle loam, 0 to 3 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Low stream terraces in river valleys
Position on the landform: Treads
Size of areas: 2 to 50 acres

Map Unit Composition

Mongle and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—brown loam

Subsoil:
9 to 20 inches—brown loam; light brownish gray iron depletions and strong brown masses of oxidized iron
20 to 37 inches—gray loam; black iron-manganese concretions and strong brown masses of oxidized iron
37 to 65 inches—gray loam; strong brown masses of oxidized iron and black iron-manganese concretions

Minor Components

Dissimilar components:
- Ingledove and Wheeling soils, which are well drained; in similar areas
- Maurertown soils, which are poorly drained; in similar areas
- Tumbling soils, which are well drained and have more clay than the Mongle soil; on footslopes
- Wyrick soils, which are well drained; on footslopes

Similar components:
- Botetourt and Ebbing soils, which are moderately well drained; in similar areas
- Soils that have clayey, sandy, or gravelly subsoils, in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.2 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Somewhat poorly drained
Depth to seasonal water saturation: About 6 to 18 inches
Water table kind: Apparent
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Very high
Surface fragments: None
Parent material: Fine-loamy alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn; moderately suited to grass-legume hay; not suited to tobacco and alfalfa hay

- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- The root system of some shallow-rooted crops may be damaged by frost action.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Vegetation is limited to species that are tolerant of wetness and poor drainage.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.

Woodland

Suitability: Moderately suited to sweetgum
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- This soil is unsuited to septic tank absorption fields. The rare flooding limits the absorption and proper treatment of effluent from septic systems, and rapidly moving floodwaters may damage some components of septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Prime farmland if drained
Land capability class: 4w
Virginia soil management group: H
Hydric soil: No

34B—Monongahela silt loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Intermediate stream terraces in river valleys
Position on the landform: Treads
Size of areas: 2 to 30 acres

Map Unit Composition

Monongahela and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown silt loam

Subsoil:
10 to 27 inches—yellowish brown clay loam
27 to 65 inches—brownish yellow silt loam; light gray iron depletions

Minor Components

Dissimilar components:
- Poorly drained soils in similar areas
- Westmoreland soils, which are shallower to bedrock than the Monongahela soil; in similar areas and on uplands
- Allegheny soils, which are well drained; in similar areas
- Shottower soils, which are well drained and have more clay in the subsoil than the Monongahela soil; on high river terraces or in similar areas
- Wheeling and Ingledove soils, which are well drained and susceptible to rare flooding; on low river terraces
- Weikert soils, which are shallower to bedrock than the Monongahela soil; in similar areas and on uplands

Similar components:
- Soils that have no root-restricting layer in the subsoil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.6 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: 18 to 30 inches to fragipan
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 36 inches
Water table kind: Perched
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Alluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- Soil wetness may limit the use of equipment.

Building sites

- Because of wetness, this soil is poorly suited to building site development.
- Because of the seasonal high water table, the period when excavations can be made is restricted and a higher degree of construction site development and building maintenance may be required.

Septic tank absorption fields

- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The limited depth to a fragipan affects the ease of excavation and grading.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: W
Hydric soil: No

34C—Monongahela silt loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Intermediate stream terraces in river valleys
Position on the landform: Treads
Size of areas: 2 to 20 acres

Map Unit Composition

Monongahela and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown silt loam

Subsoil:
10 to 27 inches—yellowish brown clay loam
27 to 65 inches—brownish yellow silt loam; light gray iron depletions

Minor Components

Dissimilar components:
- Poorly drained soils in similar areas
- Westmoreland soils, which are shallower to bedrock than the Monongahela soil; in similar areas and on uplands
- Allegheny soils, which are well drained; in similar areas
- Shottower soils, which are well drained and have more clay in the subsoil than the Monongahela soil; on high river terraces or in similar areas
- Wheeling and Ingledove soils, which are well drained and susceptable to rare flooding; on low river terraces
- Weikert soils, which are shallower to bedrock than the Monongahela soil; in similar areas and on uplands

Similar components:
- Soils that have no root-restricting layer in the subsoil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 4.6 inches)
Slowest saturated hydraulic conductivity: Moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: 18 to 30 inches to fragipan
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 36 inches
Water table kind: Perched
Flooding hazard: None

Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Alluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Poorly suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- Soil wetness may limit the use of equipment.

Building sites

- Because of wetness, this soil is poorly suited to building site development.
- Because of the seasonal high water table, the period when excavations can be made is restricted and a higher degree of construction site development and building maintenance may be required.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The limited depth to a fragipan affects the ease of excavation and grading.
- Because of the slope, special design of local roads and streets is needed.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: W
Hydric soil: No

35C—Pigeonroost loam, 7 to 15 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Mountains on uplands
Position on the landform: Dominantly summits and shoulders; backslopes in some areas
Size of areas: 2 to 5 acres

Map Unit Composition

Pigeonroost and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—dark brown loam

Subsoil:
10 to 23 inches—yellowish brown loam

Substratum:
23 to 36 inches—yellowish brown loam

Soft bedrock:
36 to 60 inches—bedrock

Minor Components

Dissimilar components:
- Edneytown soils, which are deeper to bedrock than the Pigeonroost soil; in similar areas
- Tate soils, which are deeper to bedrock than the Pigeonroost soil; on footslopes and along drainageways

- Greenlee soils, which have many subangular rock fragments and are deeper to bedrock than the Pigeonroost soil; on footslopes and along drainageways
- Areas that have rock outcrops

Similar components:
- Konnarock soils, which have more silt than the Pigeonroost soil; in similar areas
- Soils that have more surface channers than the Pigeonroost soil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Residuum weathered from graywacke and/or other igneous and metamorphic rocks

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; poorly suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to eastern white pine; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.

- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: U
Hydric soil: No

35D—Pigeonroost loam, 15 to 25 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Mountains on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 40 acres

Map Unit Composition

Pigeonroost and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—dark brown loam

Subsoil:
10 to 23 inches—yellowish brown loam

Substratum:
23 to 36 inches—yellowish brown loam

Soft bedrock:
36 to 60 inches—bedrock

Minor Components

Dissimilar components:
- Edneytown soils, which are deeper to bedrock than the Pigeonroost soil; in similar areas
- Tate soils, which are deeper to bedrock than the Pigeonroost soil; on footslopes and along drainageways
- Greenlee soils, which have many subangular rock fragments and are deeper to bedrock than the Pigeonroost soil; on footslopes and along drainageways
- Areas that have rock outcrops

Similar components:
- Konnarock soils, which have more silt than the Pigeonroost soil; in similar areas
- Soils that have more surface channers than the Pigeonroost soil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from graywacke and/or other igneous and metamorphic rocks

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn and grass-legume hay; poorly suited to tobacco and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Careful selection and application of pesticides and fertilizers helps to minimize the possibility of ground-water contamination in highly permeable soils.
- The rooting depth of some crops is restricted by bedrock.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to eastern white pine; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: U
Hydric soil: No

35E—Pigeonroost loam, 25 to 80 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Mountains on uplands
Position on the landform: Backslopes
Size of areas: 2 to 200 acres

Map Unit Composition

Pigeonroost and similar soils: Typically 80 percent; ranging from about 65 to 90 percent

Typical Profile

Surface layer:
0 to 10 inches—dark brown loam

Subsoil:
10 to 23 inches—yellowish brown loam

Substratum:
23 to 36 inches—yellowish brown loam

Soft bedrock:
36 to 60 inches—bedrock

Minor Components

Dissimilar components:
- Edneytown soils, which are deeper to bedrock than the Pigeonroost soil; in similar areas
- Tate soils, which are deeper to bedrock than the Pigeonroost soil; on footslopes and along drainageways
- Greenlee soils, which have many subangular rock fragments and are deeper to bedrock than the Pigeonroost soil; on footslopes and along drainageways
- Areas that have rock outcrops

Similar components:
- Konnarock soils, which have more silt than the Pigeonroost soil; in similar areas
- Soils that have more surface channers than the Pigeonroost soil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Moderately deep (20 to 40 inches)
Depth to root-restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Residuum weathered from graywacke and/or other igneous and metamorphic rocks

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Well suited to eastern white pine; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.

- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the nature and depth of the soft bedrock, the ease of excavation is reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: U
Hydric soil: No

36F—Rock outcrop-Opequon complex, 50 to 80 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Generally along rivers and streams; Rock outcrops are near-vertical cliffs; the Opequon soil occurs on backslopes and ledges of cliffs and have slopes ranging from 50 to 80 percent
Size of areas: 2 to 30 acres

Map Unit Composition

Note: The Opequon soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Rock outcrop: Typically 40 percent; ranging from about 30 to 50 percent
Opequon and similar soils: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. The outcrops are near-vertical cliffs.

Opequon

Surface layer:
0 to 8 inches—brown silty clay loam

Subsoil:
8 to 14 inches—strong brown silty clay

Hard bedrock:
14 inches—limestone bedrock

Minor Components

Dissimilar components:
- Westmoreland soils, which are deeper to bedrock and have less clay in the subsoil than the Opequon soil; in similar areas
- Wyrick soils, which are deeper to bedrock than the Opequon soil; at the base of steep slopes
- Litz soils, which have more rock fragments and less clay in the subsoil than the Opequon soil; in similar areas
- Soils that have extremely stony or extremely rubbly surfaces, are deeper to bedrock than the Opequon soil, and have more rock fragments in the soil; at the base of slopes below limestone rock outcrops

Similar components:
- Faywood soils, which are deeper to bedrock than the Opequon soil; in similar areas

Properties and Qualities of the Opequon Soil

Available water capacity: Very low (about 1.8 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.20 in/hr)
Depth class: Shallow (10 to 20 inches)
Depth to root-restrictive feature: 12 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: High
Runoff class: Very high
Surface fragments: About 0.1 to 3.0 percent subangular flagstones
Parent material: Clayey residuum weathered from limestone

Use and Management Considerations

Cropland

- Because of the proximity to steep river bluffs, this map unit is not recommended for cropland.

Pasture

- Because of the proximity to steep river bluffs, this map unit is not recommended for pasture.

Woodland

- Because of the proximity to steep river bluffs, this map unit is not recommended for timber production.

Building sites

- Because of the proximity to steep river bluffs, this map unit is not recommended for building sites.

Septic tank absorption fields

- Because of the proximity to steep river bluffs, this map unit is not recommended for septic tank absorption fields.

Local roads and streets

- Because of the proximity to steep river bluffs, this map unit is not recommended for local roads and streets.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Rock outcrop—8s; Opequon—7s
Virginia soil management group: Rock outcrop—none assigned; Opequon—JJ
Hydric soils: No

37B—Shottower loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: High stream terraces in river valleys
Position on the landform: Summits
Size of areas: 2 to 15 acres

Map Unit Composition

Shottower and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

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

Subsoil:
8 to 21 inches—strong brown clay loam
21 to 29 inches—yellowish red clay; yellow mottles
29 to 65 inches—red gravelly clay; yellow mottles

Minor Components

Dissimilar components:
- Monongahela soils, which are moderately well drained and have less clay than the Shottower soil; in similar areas

Similar components:
- Allegheny soils, which have less clay than the Shottower soil; in similar areas
- Watahala soils, which have many chert rock fragments; on uplands
- Frederick and Hagerstown soils, which do not have rounded cobbles; on uplands
- Soils that have cobbly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 7.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None

Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Low
Surface fragments: None
Parent material: Clayey alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; moderately suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: O
Hydric soil: No

37C—Shottower loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: High stream terraces in river valleys
Position on the landform: Summits and shoulders
Size of areas: 2 to 160 acres

Map Unit Composition

Shottower and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

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

Subsoil:
8 to 21 inches—strong brown clay loam
21 to 29 inches—yellowish red clay; yellow mottles
29 to 65 inches—red gravelly clay; yellow mottles

Minor Components

Dissimilar components:
- Monongahela soils, which are moderately well drained and have less clay than the Shottower soil; in similar areas

Similar components:
- Allegheny soils, which have less clay than the Shottower soil; in similar areas
- Watahala soils, which have many chert rock fragments; on uplands
- Frederick and Hagerstown soils, which do not have rounded cobbles; on uplands
- Soils that have cobbly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 7.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: None
Parent material: Clayey alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: O
Hydric soil: No

37D—Shottower loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: High stream terraces in river valleys
Position on the landform: Backslopes
Size of areas: 2 to 50 acres

Map Unit Composition

Shottower and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

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

Subsoil:
8 to 21 inches—strong brown clay loam
21 to 29 inches—yellowish red clay; yellow mottles
29 to 65 inches—red gravelly clay; yellow mottles

Minor Components

Dissimilar components:
- Monongahela soils, which are moderately well drained and have less clay than the Shottower soil; in similar areas

Similar components:
- Allegheny soils, which have less clay than the Shottower soil; in similar areas
- Watahala soils, which have many chert rock fragments; on uplands
- Frederick and Hagerstown soils, which do not have rounded cobbles; on uplands
- Soils that have cobbly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 7.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High

Surface fragments: None
Parent material: Clayey alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: O
Hydric soil: No

38A—Sindion silt loam, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Floodplains along major rivers and small creeks
Position on the landform: Floodplain steps
Size of areas: 2 to 130 acres

Map Unit Composition

Sindion and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 9 inches—dark brown silt loam
9 to 18 inches—dark brown loam

Subsoil:
18 to 34 inches—very dark gray clay loam
34 to 46 inches—very dark grayish brown clay loam; dark gray iron depletions

Substratum:
46 to 65 inches—dark gray silty clay loam; dark bluish gray iron depletions and yellowish brown masses of oxidized iron

Minor Components

Dissimilar components:
- Clubcaf soils, which are poorly drained; in similar areas
- Wheeling soils, which are well drained and less susceptible to flooding than the Sindion soil; on low terraces
- Wyrick soils, which are well drained and not susceptible to flooding; on colluvial footslopes
- Marbie soils, which have a dense layer in the subsoil and are not susceptible to flooding; on colluvial footslopes
- Timberville soils, which are well drained; in the bottoms of drainageways

Similar components:
- Speedwell and Wolfgap soils, which are well drained; in similar areas
- Soils that are somewhat poorly drained, in similar areas

Soil Properties and Qualities

Available water capacity: High (about 9.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)

Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Moderately well drained
Depth to seasonal water saturation: About 18 to 36 inches
Water table kind: Apparent
Flooding hazard: Occasional
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Alluvium derived from limestone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; not suited to alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- The root system of some shallow-rooted crops may be damaged by frost action.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- The root systems of plants may be damaged by frost action. This damage is more pronounced in areas of insufficient plant cover.

Woodland

Suitability: Moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should focus on streamside management zones and stream crossings and should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- Soil wetness may limit the use of equipment.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- Because of flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding and the structural damage caused by low soil strength.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2w
Virginia soil management group: B
Hydric soil: No

39A—Speedwell loam, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Floodplains along the Middle and South Forks of the Holston River
Position on the landform: Floodplain steps
Size of areas: 2 to 20 acres

Map Unit Composition

Speedwell and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 11 inches—dark brown loam

Subsoil:
11 to 23 inches—dark yellowish brown loam
23 to 36 inches—yellowish brown loam
36 to 65 inches—yellowish brown loam; strong brown masses of oxidized iron

Minor Components

Dissimilar components:
- Mongle soils, which are somewhat poorly drained and less susceptible to flooding than the Speedwell soil; on low terraces
- Ebbing soils, which are moderately well drained, have a more developed subsoil than the Speedwell soil, and are less susceptible to flooding; on low river terraces
- Wheeling soils, which are well drained, have a better developed subsoil than the Speedwell soil, and are less susceptible to flooding; on low terraces

Similar components:
- Sindion soils, which are moderately well drained; in similar areas

Soil Properties and Qualities

Available water capacity: High (about 11.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained

Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Occasional
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.

Woodland

Suitability: Moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should focus on streamside management zones and stream crossings and should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- Because of flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 1
Virginia soil management group: A
Hydric soil: No

40B—Tate loam, 2 to 7 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 10 acres

Map Unit Composition

Tate and similar soils: Typically 80 percent; ranging from about 70 to 85 percent

Typical Profile

Surface layer:
0 to 6 inches—dark brown loam

Subsoil:
6 to 28 inches—dark yellowish brown clay loam
28 to 65 inches—yellowish brown clay loam

Minor Components

Dissimilar components:
- Lily, Konnarock, and Pigeonroost soils, which are shallower to bedrock than the Tate soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Monongahela soils, which are moderately well drained; on low and intermediate terraces

Similar components:
- Greenlee soils, which have more rock fragments than the Tate soil; in similar areas
- Soils that have more clay in the subsoil than the Tate soil, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 7.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from rhyolite, rhythmite, tillite, and felsite

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; moderately suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.

- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar and eastern white pine; moderately suited to northern red oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- This soil is well suited to building sites.

Septic tank absorption fields

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: O
Hydric soil: No

40C—Tate loam, 7 to 15 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 60 acres

Map Unit Composition

Tate and similar soils: Typically 80 percent; ranging from about 70 to 85 percent

Typical Profile

Surface layer:
0 to 6 inches—dark brown loam

Subsoil:
6 to 28 inches—dark yellowish brown clay loam
28 to 65 inches—yellowish brown clay loam

Minor Components

Dissimilar components:
- Lily, Konnarock, and Pigeonroost soils, which are shallower to bedrock than the Tate soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Monongahela soils, which are moderately well drained; on low and intermediate terraces

Similar components:
- Greenlee soils, which have more rock fragments than the Tate soil; in similar areas
- Soils that have more clay in the subsoil than the Tate soil, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 7.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Colluvium derived from rhyolite, rhythmite, tillite, and felsite

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar and eastern white pine; moderately suited to northern red oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: O
Hydric soil: No

40D—Tate loam, 15 to 25 percent slopes

Setting

Major land resource area: Blue Ridge (MLRA 130)
Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes
Size of areas: 2 to 25 acres

Map Unit Composition

Tate and similar soils: Typically 80 percent; ranging from about 70 to 85 percent

Typical Profile

Surface layer:
0 to 6 inches—dark brown loam

Subsoil:
6 to 28 inches—dark yellowish brown clay loam
28 to 65 inches—yellowish brown clay loam

Minor Components

Dissimilar components:
- Lily, Konnarock, and Pigeonroost soils, which are shallower to bedrock than the Tate soil; on uplands
- Atkins soils, which are poorly drained; on floodplains
- Ernest soils, which are moderately well drained; in similar areas
- Monongahela soils, which are moderately well drained; on low and intermediate terraces

Similar components:
- Greenlee soils, which have more rock fragments than the Tate soil; in similar areas
- Soils that have more clay in the subsoil than the Tate soil, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 7.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Colluvium derived from rhyolite, rhythmite, tillite, and felsite

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar and eastern white pine; moderately suited to northern red oak
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: O
Hydric soil: No

41B—Timberville-Marbie complex, 2 to 7 percent slopes, frequently flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 45 acres

Map Unit Composition

Note: The Timberville and Marbie soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Timberville and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Marbie and similar soils: Typically 35 percent; ranging from about 30 to 40 percent

Typical Profile

Timberville

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

Subsoil:
10 to 31 inches—yellowish brown silt loam
31 to 38 inches—yellowish brown silty clay loam
38 to 51 inches—brownish yellow silty clay loam; light gray iron depletions, strong brown masses of oxidized iron, and black iron-manganese concretions
51 to 65 inches—strong brown silty clay loam; black iron-manganese concretions, light gray iron depletions, and red masses of oxidized iron

Marbie

Surface layer:
0 to 7 inches—dark yellowish brown silt loam

Subsoil:
7 to 18 inches—yellowish brown silt loam; black manganese coatings
18 to 41 inches—yellowish brown silt loam; brownish yellow masses of oxidized iron, light brownish gray iron depletions, and black manganese coatings
41 to 65 inches—strong brown silty clay loam; black manganese coatings

Minor Components

Dissimilar components:
- Frederick, Groseclose, and Hagerstown soils, which have more clay in the subsoil than the Timberville and Marbie soils; on uplands
- Watahala soils, which have more clay and chert rock fragments than the Timberville and Marbie soils; on uplands
- Westmoreland soils, which are shallower to bedrock than the Timberville and Marbie soils; on uplands
- Hayter and Wyrick soils, which are well drained and not susceptible to flooding; on colluvial footslopes
- Clubcaf soils, which are poorly drained; on floodplains
- Rock outcrops in similar areas

Similar components:
- Sindion soils, which are moderately well drained and susceptible to flooding; on floodplains
- Soils that have gravelly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Timberville—high (about 10.1 inches); Marbie—low (about 3.7 inches)
Slowest saturated hydraulic conductivity: Timberville—moderately high (about 0.6 in/hr); Marbie—moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Timberville—none; Marbie—18 to 36 inches to fragipan
Drainage class: Timberville—well drained; Marbie—moderately well drained
Depth to seasonal water saturation: Timberville—more than 6 feet; Marbie—about 24 to 48 inches
Flooding hazard: Frequent
Ponding hazard: None
Shrink-swell potential: Moderate

Runoff class: Medium
Surface fragments: None
Parent material: Timberville—alluvium and/or colluvium derived from limestone, sandstone, and shale; Marbie—fine-loamy colluvium derived from limestone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; moderately suited to alfalfa hay

- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should focus on streamside management zones and stream crossings and should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.

Building sites

- Because of flooding, these soils are unsuited to building site development.
- Because of the frequent flooding, the risk of damage associated with floodwaters is greatly increased.

Septic tank absorption fields

- Because of flooding, these soils are unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- The limited depth to a fragipan affects the ease of excavation and grading.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Timberville—2w; Marbie—3w
Virginia soil management group: Timberville—G; Marbie—W
Hydric soils: No

42C—Timberville-Marbie complex, 7 to 15 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 100 acres

Map Unit Composition

Note: The Timberville and Marbie soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Timberville and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Marbie and similar soils: Typically 35 percent; ranging from about 30 to 40 percent

Typical Profile

Timberville

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

Subsoil:
10 to 31 inches—yellowish brown silt loam
31 to 38 inches—yellowish brown silty clay loam
38 to 51 inches—brownish yellow silty clay loam; light gray iron depletions, strong brown masses of oxidized iron, and black iron-manganese concretions
51 to 65 inches—strong brown silty clay loam; black iron-manganese concretions, light gray iron depletions, and red masses of oxidized iron

Marbie

Surface layer:
0 to 7 inches—dark yellowish brown silt loam

Subsoil:
7 to 18 inches—yellowish brown silt loam; black manganese coatings

18 to 41 inches—yellowish brown silt loam; brownish yellow masses of oxidized iron, light brownish gray iron depletions, and black manganese coatings
41 to 65 inches—strong brown silty clay loam; black manganese coatings

Minor Components

Dissimilar components:
- Frederick, Groseclose, and Hagerstown soils, which have more clay in the subsoil than the Timberville and Marbie soils; on uplands
- Watahala soils, which have more clay and chert rock fragments than the Timberville and Marbie soils; on uplands
- Westmoreland soils, which are shallower to bedrock than the Timberville and Marbie soils; on uplands
- Hayter and Wyrick soils, which are well drained and not susceptible to flooding; on colluvial footslopes
- Clubcaf soils, which are poorly drained; on floodplains
- Rock outcrops in similar areas

Similar components:
- Sindion soils, which are moderately well drained and susceptible to flooding; on floodplains
- Soils that have gravelly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: Timberville—high (about 10.1 inches); Marbie—low (about 3.7 inches)
Slowest saturated hydraulic conductivity: Timberville—moderately high (about 0.6 in/hr); Marbie—moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Timberville—none; Marbie—18 to 36 inches to fragipan
Drainage class: Timbervile—well drained; Marbie—moderately well drained
Depth to seasonal water saturation: Timberville—more than 6 feet; Marbie—about 24 to 48 inches
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Timberville—medium; Marbie—high
Surface fragments: None
Parent material: Timberville—alluvium and/or colluvium derived from limestone, sandstone, and shale; Marbie—fine-loamy colluvium derived from limestone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of

trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- These soils are well suited to haul roads and log landings.
- These soils are well suited to equipment operations.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- These soils are unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- These soils are unsuited to septic tank absorption fields because of the flooding.
- The rare flooding limits the absorption and proper treatment of effluent from septic systems, and rapidly moving floodwaters may damage some components of septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- The limited depth to a fragipan affects the ease of excavation and grading.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: Timberville—G; Marbie—W
Hydric soils: No

43B—Tumbling loam, 2 to 7 percent slopes, very bouldery

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 50 acres

Map Unit Composition

Tumbling and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown loam

Subsoil:
6 to 19 inches—strong brown clay loam
19 to 47 inches—yellowish red clay
47 to 65 inches—red cobbly clay

Minor Components

Dissimilar components:
- Weikert and Lily soils, which are shallower to bedrock than the Tumbling soil; on upland backslopes
- Atkins soils, which are poorly drained; on floodplains
- Mongle soils, which are somewhat poorly drained; on low river terraces
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Macove soils, which have less clay and more rock fragments in the subsoil and more boulders on the surface than the Tumbling soil; in similar areas
- Soils that have less clay in the subsoil than the Tumbling soil, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: About 1 to 3 percent subrounded boulders
Parent material: Clayey colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The high content of stones or boulders on the surface may obstruct the construction of haul roads and log landings.
- The amount of rock fragments on the surface may reduce the traction of wheeled harvest equipment and interfere with the use of site preparation equipment.

Building sites

- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: O
Hydric soil: No

43C—Tumbling loam, 7 to 15 percent slopes, very bouldery

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas in valleys

Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 100 acres

Map Unit Composition

Tumbling and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown loam

Subsoil:
6 to 19 inches—strong brown clay loam
19 to 47 inches—yellowish red clay
47 to 65 inches—red cobbly clay

Minor Components

Dissimilar components:
- Weikert and Lily soils, which are shallower to bedrock than the Tumbling soil; on upland backslopes
- Atkins soils, which are poorly drained; on floodplains
- Mongle soils, which are somewhat poorly drained; on low river terraces
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Macove soils, which have less clay and more rock fragments in the subsoil and more boulders on the surface than the Tumbling soil; in similar areas
- Soils that have less clay in the subsoil than the Tumbling soil, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: About 1 to 3 percent subrounded boulders
Parent material: Clayey colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential

negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The high content of stones or boulders on the surface may obstruct the construction of haul roads and log landings.
- The amount of rock fragments on the surface may reduce the traction of wheeled harvest equipment and interfere with the use of site preparation equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7s
Virginia soil management group: O
Hydric soil: No

43D—Tumbling loam, 15 to 25 percent slopes, very bouldery

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of mountains and areas in valleys
Position on the landform: Footslopes
Size of areas: 2 to 100 acres

Map Unit Composition

Tumbling and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown loam

Subsoil:
6 to 19 inches—strong brown clay loam
19 to 47 inches—yellowish red clay
47 to 65 inches—red cobbly clay

Minor Components

Dissimilar components:
- Weikert and Lily soils, which are shallower to bedrock than the Tumbling soil; on upland backslopes
- Atkins soils, which are poorly drained; on floodplains
- Mongle soils, which are somewhat poorly drained; on low river terraces
- Ernest soils, which are moderately well drained; in similar areas
- Rock outcrops adjacent to drainageways

Similar components:
- Macove soils, which have less clay and more rock fragments in the subsoil and more boulders on the surface than the Tumbling soil; in similar areas
- Soils that have less clay in the subsoil than the Tumbling soil, in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: About 1 to 3 percent subrounded boulders
Parent material: Clayey colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The high content of stones or boulders on the surface may obstruct the construction of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

- The amount of rock fragments on the surface may reduce the traction of wheeled harvest equipment and interfere with the use of site preparation equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7s
Virginia soil management group: O
Hydric soil: No

44B—Tumbling loam, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 30 acres

Map Unit Composition

Tumbling and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown loam

Subsoil:
6 to 19 inches—strong brown clay loam
19 to 47 inches—yellowish red clay
47 to 65 inches—red cobbly clay

Minor Components

Dissimilar components:

- Litz and Lily soils, which are shallower to bedrock than the Tumbling soil; on steep backslopes

- Mongle soils, which are somewhat poorly drained; on low river terraces
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Rock outcrops in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Tumbling soil and are frequently flooded; in the bottoms of colluvial drainageways
- Atkins soils, which are poorly drained; on floodplains

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Tumbling soil; in similar areas
- Frederick and Groseclose soils, which do not have semi-rounded rock fragments; in similar areas
- Shottower soils, which have rounded rock fragments and are redder than the Tumbling soil; in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Clayey colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; moderately suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental

benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: O
Hydric soil: No

44C—Tumbling loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and mountains and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 70 acres

Map Unit Composition

Tumbling and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown loam

Subsoil:
6 to 19 inches—strong brown clay loam
19 to 47 inches—yellowish red clay
47 to 65 inches—red cobbly clay

Minor Components

Dissimilar components:
- Litz and Lily soils, which are shallower to bedrock than the Tumbling soil; on steep backslopes
- Mongle soils, which are somewhat poorly drained; on low river terraces
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Rock outcrops in similar areas

- Timberville soils, which are darker and have thicker surface horizons than the Tumbling soil and are frequently flooded; in the bottoms of colluvial drainageways
- Atkins soils, which are poorly drained; on floodplains

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Tumbling soil; in similar areas
- Frederick and Groseclose soils, which do not have semi-rounded rock fragments; in similar areas
- Shottower soils, which have rounded rock fragments and are redder than the Tumbling soil; in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Clayey colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.

- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: O
Hydric soil: No

44D—Tumbling loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and mountains and areas in valleys
Position on the landform: Footslopes
Size of areas: 3 to 60 acres

Map Unit Composition

Tumbling and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown loam

Subsoil:
6 to 19 inches—strong brown clay loam
19 to 47 inches—yellowish red clay
47 to 65 inches—red cobbly clay

Minor Components

Dissimilar components:
- Litz and Lily soils, which are shallower to bedrock than the Tumbling soil; in similar areas

- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Rock outcrops in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Tumbling soil and are frequently flooded; in the bottoms of colluvial drainageways
- Atkins soils, which are poorly drained; on floodplains

Similar components:
- Wyrick soils, which have less clay in the subsoil than the Tumbling soil; in similar areas
- Frederick and Groseclose soils, which do not have semi-rounded rock fragments; in similar areas
- Shottower soils, which have rounded rock fragments and are redder than the Tumbling soil; in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Clayey colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.

- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: O
Hydric soil: No

44E—Tumbling loam, 25 to 45 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and mountains and areas on hills and mountains
Position on the landform: Dominantly footslopes; lower backslopes in some areas
Size of areas: 2 to 75 acres

Map Unit Composition

Tumbling and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 6 inches—brown loam

Subsoil:
6 to 19 inches—strong brown clay loam
19 to 47 inches—yellowish red clay
47 to 65 inches—red cobbly clay

Minor Components

Dissimilar components:

- Litz and Lily soils, which are shallower to bedrock than the Tumbling soil; on steep backslopes

- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Rock outcrops in similar areas
- Timberville soils, which are darker and have thicker surface horizons than the Tumbling soil and are frequently flooded; in the bottoms of colluvial drainageways
- Atkins soils, which are poorly drained; on floodplains

Similar components:

- Wyrick soils, which have less clay in the subsoil than the Tumbling soil; in similar areas
- Frederick and Groseclose soils, which do not have semi-rounded rock fragments; in similar areas
- Shottower soils, which have rounded rock fragments and are redder than the Tumbling soil; in similar areas

Soil Properties and Qualities

Available water capacity: Moderate (about 8.1 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Clayey colluvium derived from sandstone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required;

special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: O
Hydric soil: No

45—Udorthents, 0 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills
Position on the landform: Cut and fill areas
Size of areas: 2 to 100 acres

Map Unit Composition

Udorthents and similar soils: Typically 70 percent; ranging from about 60 to 80 percent

Typical Profile

Udorthents have resulted from disturbance of soil by land leveling, excavation, or filling. They consist of loamy and clayey soil material and varying amounts of rock fragments. Depth to hard bedrock varies from a few inches to more than 5 feet. Areas range from severely compacted to slightly compacted. Drainage is variable. Because of the variability of the soil material, a typical profile is not given.

Minor Components

Dissimilar components:
- Frederick soils, which are very deep and well drained; on uplands
- Sindion soils, which are very deep and moderately well drained; on floodplains
- Weikert soils, which are shallow to shale bedrock and well drained; on uplands
- Areas of nonsoil materials such as concrete, wood, glass, and asphalt

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: None assigned
Virginia soil management group: None assigned
Hydric soils: No

46—Udorthents, dams

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills
Position on the landform: Areas containing flood-control earthen dams
Size of areas: Less than 15 acres

Map Unit Composition

Udorthents, dams, and similar soils: Typically 95 percent; ranging from about 90 to 100 percent

Typical Profile

Udorthents have resulted from disturbance of soil by land leveling, excavation, or filling. They consist of loamy and clayey soil material and varying amounts of rock fragments. Depth to hard bedrock varies from a few inches to more than 5 feet. Areas range from severely compacted to slightly compacted. Because of the variability of the soil material, a typical profile is not given.

Minor Components

Dissimilar components:
- Frederick soils, which are very deep and well drained; on uplands
- Sindion soils, which are very deep and moderately well drained; on floodplains
- Weikert soils, which are shallow to shale bedrock and well drained; on uplands
- Areas of nonsoil materials such as concrete, wood, glass, and asphalt

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: None assigned
Virginia soil management group: None assigned
Hydric soils: No

47—Udorthents-Urban land complex, 0 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills
Position on the landform: Cut and fill areas and areas containing towns, highways, housing developments, industrial parks, landfills, shopping centers, or other man-made areas (excluding surface mines and gravel quarries)
Size of areas: 2 to 275 acres

Map Unit Composition

Note: The Udorthents and Urban land occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Udorthents and similar soils: Typically 40 percent; ranging from about 35 to 45 percent
Urban land: Typically 35 percent; ranging from about 30 to 40 percent

Typical Profile

Udorthents

Udorthents have resulted from disturbance of soil by land leveling, excavation, or filling. They consist of loamy and clayey soil material and varying amounts of rock fragments. Depth to hard bedrock varies from a few inches to more than 5 feet. Areas range from severely compacted to slightly compacted. Drainage is variable. Because of the variability of the soil material, a typical profile is not given.

Urban land

Urban land consists of areas covered by asphalt or concrete, such as roadways, airport runways, or parking lots. Also included are structures, buildings, and other impervious surfaces. A typical profile is not given.

Minor Components

Dissimilar components:
- Frederick soils, which are very deep and well drained; on uplands
- Sindion soils, which are very deep and moderately well drained; on floodplains
- Weikert soils, which are shallow to shale bedrock and well drained; on uplands
- Areas of nonsoil materials such as concrete, wood, glass, and asphalt

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: None assigned
Virginia soil management group: None assigned
Hydric soils: No

48—Urban land

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills
Position on the landform: Areas containing towns, highways, housing developments, industrial parks, landfills, shopping centers, or other man-made areas (excluding surface mines and gravel quarries)
Size of areas: 2 to 130 acres

Map Unit Composition

Urban land: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Urban land consists of areas covered by asphalt or concrete, such as roadways, airport runways, or parking lots. Also included are structures, buildings, and other impervious surfaces. A typical profile is not given.

Minor Components

Dissimilar components:
- Frederick soils, which are very deep and well drained; on uplands
- Sindion soils, which are very deep and moderately well drained; on floodplains
- Weikert soils, which are shallow to shale bedrock and well drained; on uplands
- Areas of nonsoil materials such as concrete, wood, glass, and asphalt
- Udorthents (soil material in areas that have been altered during excavation or covered by earthy fill material)

Use and Management Considerations

- Onsite investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: None assigned
Virginia soil management group: None assigned
Hydric soils: No

49C—Watahala very gravelly loam, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits and shoulders
Size of areas: 2 to 15 acres

Map Unit Composition

Watahala and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—brown very gravelly loam

Subsurface layer:
5 to 15 inches—yellowish brown gravelly loam

Subsoil:
15 to 25 inches—yellowish brown gravelly loam
25 to 30 inches—strong brown gravelly silt loam
30 to 65 inches—yellowish red clay

Minor Components

Dissimilar components:
- Marbie soils, which are moderately well drained; on colluvial footslopes
- Timberville soils, which are darker and have thicker surface horizons than the Watahala soil; in the bottoms of drainageways and sinkholes
- Rock outcrops, shallower soils, and sinkholes in similar areas

Similar components:
- Elliber soils, which have less clay in the subsoil than the Watahala soil; in similar areas

- Frederick soils, which have less than 35 percent rock fragments throughout and have more clay in the upper part than the Watahala soil; in similar areas
- Shottower soils, which have less than 35 percent rock fragments throughout and have rounded cobbles; on high stream terraces
- Wyrick soils, which have less than 15 percent rock fragments throughout; on colluvial fans
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that are silty clay loam or silt loam in the lower part of the subsoil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 3.5 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.20 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: 20 to 50 inches to strongly contrasting textural stratification
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Medium
Surface fragments: About 0.5 to 3.0 percent coarse angular gravel
Parent material: Gravelly residuum over clayey residuum weathered from cherty limestone

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Plants may suffer from moisture stress because of the limited available water capacity; incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Using a system of conservation tillage that minimizes soil disturbance when pastures are established conserves soil moisture.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4s
Virginia soil management group: M
Hydric soil: No

49D—Watahala very gravelly loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 80 acres

Map Unit Composition

Watahala and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—brown very gravelly loam

Subsurface layer:
5 to 15 inches—yellowish brown gravelly loam

Subsoil:
15 to 25 inches—yellowish brown gravelly loam
25 to 30 inches—strong brown gravelly silt loam
30 to 65 inches—yellowish red clay

Minor Components

Dissimilar components:
- Marbie soils, which are moderately well drained; on colluvial footslopes
- Timberville soils, which are darker and have thicker surface horizons than the Watahala soil; in the bottoms of drainageways and sinkholes
- Rock outcrops, shallower soils, and sinkholes in similar areas

Similar components:
- Elliber soils, which have less clay in the subsoil than the Watahala soil; in similar areas
- Frederick soils, which have less than 35 percent rock fragments throughout and have more clay in the upper part than the Watahala soil; in similar areas
- Shottower soils, which have less than 35 percent rock fragments throughout and have rounded cobbles; on high stream terraces
- Wyrick soils, which have less than 15 percent rock fragments throughout; on colluvial fans
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that are silty clay loam or silt loam in the lower part of the subsoil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 3.5 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.20 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: 20 to 50 inches to strongly contrasting textural stratification
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: About 0.5 to 3.0 percent coarse angular gravel
Parent material: Gravelly residuum over clayey residuum weathered from cherty limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: M
Hydric soil: No

49E—Watahala very gravelly loam, 25 to 45 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 2 to 80 acres

Map Unit Composition

Watahala and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 5 inches—brown very gravelly loam

Subsurface layer:
5 to 15 inches—yellowish brown gravelly loam

Subsoil:
15 to 25 inches—yellowish brown gravelly loam
25 to 30 inches—strong brown gravelly silt loam
30 to 65 inches—yellowish red clay

Minor Components

Dissimilar components:
- Marbie soils, which are moderately well drained; on colluvial footslopes
- Timberville soils, which are darker and have thicker surface horizons than the Watahala soil; in the bottoms of drainageways and sinkholes
- Rock outcrops, shallower soils, and sinkholes in similar areas

Similar components:
- Elliber soils, which have less clay in the subsoil than the Watahala soil; in similar areas
- Frederick soils, which have less than 35 percent rock fragments throughout and have more clay in the upper part than the Watahala soil; in similar areas
- Shottower soils, which have less than 35 percent rock fragments throughout and have rounded cobbles; on high stream terraces
- Wyrick soils, which have less than 15 percent rock fragments throughout; on colluvial fans
- Soils that have surface layers of silty clay loam or clay loam, in similar areas
- Soils that are silty clay loam or silt loam in the lower part of the subsoil, in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 3.5 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.20 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: 20 to 50 inches to strongly contrasting textural stratification
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: High
Surface fragments: About 0.5 to 3.0 percent coarse angular gravel
Parent material: Gravelly residuum over clayey residuum weathered from cherty limestone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Rock fragments in the soil restrict the use of equipment during site preparation for planting or seeding.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: M
Hydric soil: No

50D—Weikert silt loam, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands

Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 100 acres

Map Unit Composition

Weikert and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—brown silt loam

Subsoil:
2 to 15 inches—yellowish brown very channery silt loam

Substratum:
15 to 19 inches—yellowish brown extremely channery silt loam

Hard bedrock:
19 inches—olive brown shale bedrock

Minor Components

Dissimilar components:
- Hayter and Tumbling soils, which are well drained and deeper to bedrock than the Weikert soil; on colluvial footslopes
- Ernest soils, which are moderately well drained and deeper to bedrock than the Weikert soil; on colluvial footslopes
- Monongahela soils, which are moderately well drained and deeper to bedrock than the Weikert soil; on river terraces
- Groseclose soils, which are well drained, are deeper to bedrock than the Weikert soil, and have more clay in the subsoil; in similar areas
- Elliber soils, which are well drained, have many chert fragments in the soil, and are deeper to bedrock than the Weikert soil; in similar areas
- Allegheny soils, which are well drained and deeper to bedrock than the Weikert soil; on river terraces

Similar components:
- Berks, Konnarock, Lily, and Litz soils, which are well drained and deeper to bedrock than the Weikert soil; in similar areas
- Areas that have slopes of less than 15 percent

Soil Properties and Qualities

Available water capacity: Very low (about 1.3 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Shallow (10 to 20 inches)
Depth to root-restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

Suitability: Poorly suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are renovated.
- The rooting depth of some plants may be restricted by bedrock; species adapted to shallow root zones and droughty conditions should be planted.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity; plants on south and west aspects have more severe moisture stress.

Woodland

Suitability: Moderately suited to chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the amount of maintenance needed for haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.
- Coarse soil textures may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of the slope, special design of local roads and streets is needed.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 6s
Virginia soil management group: JJ
Hydric soil: No

50E—Weikert silt loam, 25 to 50 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)

Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 25 to 500 acres

Map Unit Composition

Weikert and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—brown silt loam

Subsoil:
2 to 15 inches—yellowish brown very channery silt loam

Substratum:
15 to 19 inches—yellowish brown extremely channery silt loam

Hard bedrock:
19 inches—olive brown shale bedrock

Minor Components

Dissimilar components:
- Hayter and Tumbling soils, which are well drained and deeper to bedrock than the Weikert soil; on colluvial footslopes
- Ernest soils, which are moderately well drained and deeper to bedrock than the Weikert soil; on colluvial footslopes
- Monongahela soils, which are moderately well drained and deeper to bedrock than the Weikert soil; on river terraces
- Groseclose soils, which are well drained, are deeper to bedrock than the Weikert soil, and have more clay in the subsoil; in similar areas
- Elliber soils, which are well drained, have many chert fragments in the soil, and are deeper to bedrock than the Weikert soil; in similar areas
- Allegheny soils, which are well drained and deeper to bedrock than the Weikert soil; on river terraces

Similar components:
- Berks, Konnarock, Lily, and Litz soils, which are well drained and deeper to bedrock than the Weikert soil; in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 1.3 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Shallow (10 to 20 inches)
Depth to root-restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the amount of maintenance needed for haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Coarse soil textures may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

50F—Weikert silt loam, 50 to 80 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 25 to 500 acres

Map Unit Composition

Weikert and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 2 inches—brown silt loam

Subsoil:
2 to 15 inches—yellowish brown very channery silt loam

Substratum:
15 to 19 inches—yellowish brown extremely channery silt loam

Hard bedrock:
19 inches—olive brown shale bedrock

Minor Components

Dissimilar components:
- Hayter and Tumbling soils, which are well drained and deeper to bedrock than the Weikert soil; on colluvial footslopes
- Ernest soils, which are moderately well drained and deeper to bedrock than the Weikert soil; on colluvial footslopes
- Monongahela soils, which are moderately well drained and deeper to bedrock than the Weikert soil; on river terraces
- Groseclose soils, which are well drained, are deeper to bedrock than the Weikert soil, and have more clay in the subsoil; in similar areas
- Elliber soils, which are well drained, have many chert fragments in the soil, and are deeper to bedrock than the Weikert soil; in similar areas
- Allegheny soils, which are well drained and deeper to bedrock than the Weikert soil; on river terraces

Similar components:
- Berks, Konnarock, Lily, and Litz soils, which are well drained and deeper to bedrock than the Weikert soil; in similar areas

Soil Properties and Qualities

Available water capacity: Very low (about 1.3 inches)
Slowest saturated hydraulic conductivity: High (about 2.0 in/hr)
Depth class: Shallow (10 to 20 inches)
Depth to root-restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Channery, loamy residuum weathered from shale and siltstone

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to chestnut oak

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.
- Coarse soil textures may reduce the traction of wheeled harvest equipment and log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is unsuited to conventional septic tank absorption fields.

Local roads and streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of the slope, designing local roads and streets is difficult.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: JJ
Hydric soil: No

51C—Westmoreland silt loam, 7 to 15 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Dominantly summits and shoulders; backslopes in some areas
Size of areas: 5 to 50 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 1 to 2 percent of the surface.

Westmoreland and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

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

Subsoil:
5 to 29 inches—yellowish brown silty clay loam

Substratum:
29 to 43 inches—yellowish brown very channery clay loam; strong brown mottles
43 to 51 inches—yellowish brown extremely channery silty clay loam; gray mottles and black manganese coatings

Hard bedrock:
51 to 61 inches—yellowish brown, black, and gray limestone bedrock

Minor Components

Dissimilar components:
- Frederick and Groseclose soils, which have more clay in the subsoil and are deeper to bedrock than the Westmoreland soil; in similar areas
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Monongahela soils, which are moderately well drained; on river terraces
- Opequon soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Timberville soils, which are deeper to bedrock, are darker, and have thicker surface layers than the Westmoreland soil; in the bottoms of colluvial drainageways
- Allegheny soils, which are deeper to bedrock than the Westmoreland soil; on river terraces
- Bland and Faywood soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Berks soils, which are shallower to bedrock than the Westmoreland soil; in similar areas
- Areas that have more than 2 percent rock outcrops

Similar components:
- Wyrick soils, which are deeper to bedrock than the Westmoreland soil; on colluvial footslopes and fans
- Hagerstown soils, which have more clay in the subsoil than the Westmoreland soil; in similar areas
- Elliber soils, which have many chert rock fragments; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Fine-loamy residuum weathered from limestone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to corn, tobacco, and grass-legume hay; poorly suited to alfalfa hay

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Rock outcrops may limit machinery operations.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs may be required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: U
Hydric soil: No

51D—Westmoreland silt loam, 15 to 25 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 5 to 50 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 1 to 2 percent of the surface.

Westmoreland and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

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

Subsoil:
5 to 29 inches—yellowish brown silty clay loam

Substratum:
29 to 43 inches—yellowish brown very channery clay loam; strong brown mottles
43 to 51 inches—yellowish brown extremely channery silty clay loam; gray mottles and black manganese coatings

Hard bedrock:
51 to 61 inches—yellowish brown, black, and gray limestone bedrock

Minor Components

Dissimilar components:
- Frederick and Groseclose soils, which have more clay in the subsoil and are deeper to bedrock than the Westmoreland soil; in similar areas
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Monongahela soils, which are moderately well drained; on river terraces
- Opequon soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas

- Timberville soils, which are deeper to bedrock, are darker, and have thicker surface layers than the Westmoreland soil; in the bottoms of colluvial drainageways
- Allegheny soils, which are deeper to bedrock than the Westmoreland soil; on river terraces
- Berks soils, which are shallower to bedrock than the Westmoreland soil; in similar areas
- Bland and Faywood soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Areas that have more than 2 percent rock outcrops

Similar components:
- Wyrick soils, which are deeper to bedrock than the Westmoreland soil; on colluvial footslopes and fans
- Hagerstown soils, which have more clay in the subsoil than the Westmoreland soil; in similar areas
- Elliber soils, which have many chert rock fragments; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Fine-loamy residuum weathered from limestone and shale

Use and Management Considerations

Cropland

Suitability: Moderately suited to grass-legume hay; poorly suited to corn, tobacco, and alfalfa hay
- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- Rock outcrops may limit machinery operations.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Moderately suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.

- Erosion control is needed when pastures are established.
- Rock outcrops may limit machinery operations.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Bedrock may interfere with the construction of haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and stre]ets

- Because of the slope, special design of local roads and streets is needed.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: U
Hydric soil: No

51E—Westmoreland silt loam, 25 to 50 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 400 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 1 to 2 percent of the surface.

Westmoreland and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

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

Subsoil:
5 to 29 inches—yellowish brown silty clay loam

Substratum:
29 to 43 inches—yellowish brown very channery clay loam; strong brown mottles
43 to 51 inches—yellowish brown extremely channery silty clay loam; gray mottles and black manganese coatings

Hard bedrock:
51 to 61 inches—yellowish brown, black, and gray limestone bedrock

Minor Components

Dissimilar components:
- Frederick and Groseclose soils, which have more clay in the subsoil and are deeper to bedrock than the Westmoreland soil; in similar areas
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Monongahela soils, which are moderately well drained; on river terraces
- Opequon soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Timberville soils, which are deeper to bedrock, are darker, and have thicker surface layers than the Westmoreland soil; in the bottoms of colluvial drainageways
- Allegheny soils, which are deeper to bedrock than the Westmoreland soil; on river terraces
- Berks soils, which are shallower to bedrock than the Westmoreland soil; in similar areas
- Bland and Faywood soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Areas that have more than 2 percent rock outcrops

Similar components:
- Wyrick soils, which are deeper to bedrock than the Westmoreland soil; on colluvial footslopes and fans
- Hagerstown soils, which have more clay in the subsoil than the Westmoreland soil; in similar areas
- Elliber soils, which have many chert rock fragments; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Fine-loamy residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure safe perfomance.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.

- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: U
Hydric soil: No

51F—Westmoreland silt loam, 50 to 70 percent slopes, rocky

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 5 to 400 acres

Map Unit Composition

Note: Outcrops of limestone bedrock cover 1 to 2 percent of the surface.

Westmoreland and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

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

Subsoil:
5 to 29 inches—yellowish brown silty clay loam

Substratum:
29 to 43 inches—yellowish brown very channery clay loam; strong brown mottles
43 to 51 inches—yellowish brown extremely channery silty clay loam; gray mottles and black manganese coatings

Hard bedrock:
51 to 61 inches—yellowish brown, black, and gray limestone bedrock

Minor Components

Dissimilar components:
- Frederick and Groseclose soils, which have more clay in the subsoil and are deeper to bedrock than the Westmoreland soil; in similar areas
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans

- Monongahela soils, which are moderately well drained; on river terraces
- Opequon soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Timberville soils, which are deeper to bedrock, are darker, and have thicker surface layers than the Westmoreland soil; in the bottoms of colluvial drainageways
- Allegheny soils, which are deeper to bedrock than the Westmoreland soil; on river terraces
- Berks soils, which are shallower to bedrock than the Westmoreland soil; in similar areas
- Bland and Faywood soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Areas that have more than 2 percent rock outcrops

Similar components:
- Wyrick soils, which are deeper to bedrock than the Westmoreland soil; on colluvial footslopes and fans
- Hagerstown soils, which have more clay in the subsoil than the Westmoreland soil; in similar areas
- Elliber soils, which have many chert rock fragments; in similar areas

Soil Properties and Qualities

Available water capacity: Low (about 5.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Fine-loamy residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This soil is unsuited to cropland.

Pasture

- This soil is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.

- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 7e
Virginia soil management group: U
Hydric soil: No

52D—Westmoreland-Rock outcrop complex, 7 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Summits, shoulders, and backslopes
Size of areas: 2 to 60 acres

Map Unit Composition

Note: The Westmoreland soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Westmoreland and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Rock outcrop: Typically 30 percent; ranging from about 10 to 50 percent

Typical Profile

Westmoreland

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

Subsoil:
5 to 29 inches—yellowish brown silty clay loam

Substratum:
29 to 43 inches—yellowish brown very channery clay loam; strong brown mottles
43 to 51 inches—yellowish brown extremely channery silty clay loam; gray mottles and black manganese coatings

Hard bedrock:
51 to 61 inches—yellowish brown, black, and gray limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. The outcrops are a few inches to about 5 feet tall.

Minor Components

Dissimilar components:
- Frederick and Groseclose soils, which have more clay in the subsoil and are deeper to bedrock than the Westmoreland soil; in similar areas
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Monongahela soils, which are moderately well drained; on river terraces
- Opequon soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Timberville soils, which are deeper to bedrock, are darker, and have thicker surface layers than the Westmoreland soil; in the bottoms of colluvial drainageways
- Allegheny soils, which are deeper to bedrock than the Westmoreland soil; on river terraces
- Berks soils, which are shallower to bedrock than the Westmoreland soil; in similar areas
- Bland and Faywood soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas

Similar components:
- Wyrick soils, which are deeper to bedrock than the Westmoreland soil; on colluvial footslopes and fans
- Hagerstown soils, which have more clay in the subsoil than the Westmoreland soil; in similar areas
- Elliber soils, which have many chert rock fragments; in similar areas

Properties and Qualities of the Westmoreland Soil

Available water capacity: Low (about 5.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None

Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Medium
Surface fragments: None
Parent material: Fine-loamy residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pasture

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, special design of local roads and streets is needed.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Westmoreland—7s; Rock outcrop—8s
Virginia soil management group: Westmoreland—U; Rock outcrop—none assigned
Hydric soils: No

52E—Westmoreland-Rock outcrop complex, 25 to 50 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 4 to 400 acres

Map Unit Composition

Note: The Westmoreland soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Westmoreland and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Rock outcrop: Typically 30 percent; ranging from about 10 to 50 percent

Typical Profile

Westmoreland

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

Subsoil:
5 to 29 inches—yellowish brown silty clay loam

Substratum:
29 to 43 inches—yellowish brown very channery clay loam; strong brown mottles
43 to 51 inches—yellowish brown extremely channery silty clay loam; gray mottles and black manganese coatings

Hard bedrock:
51 to 61 inches—yellowish brown, black, and gray limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. The outcrops are a few inches to about 5 feet tall.

Minor Components

Dissimilar components:
- Frederick and Groseclose soils, which have more clay in the subsoil and are deeper to bedrock than the Westmoreland soil; in similar areas
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Monongahela soils, which are moderately well drained; on river terraces
- Opequon soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Timberville soils, which are deeper to bedrock, are darker, and have thicker surface layers than the Westmoreland soil; in the bottoms of colluvial drainageways

- Allegheny soils, which are deeper to bedrock than the Westmoreland soil; on river terraces
- Berks soils, which are shallower to bedrock than the Westmoreland soil; in similar areas
- Bland and Faywood soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas

Similar components:
- Wyrick soils, which are deeper to bedrock than the Westmoreland soil; on colluvial footslopes and fans
- Hagerstown soils, which have more clay in the subsoil than the Westmoreland soil; in similar areas
- Elliber soils, which have many chert rock fragments; in similar areas

Properties and Qualities of the Westmoreland Soil

Available water capacity: Low (about 5.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High
Surface fragments: None
Parent material: Fine-loamy residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pasture

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
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- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Westmoreland—7s; Rock outcrop—8s
Virginia soil management group: Westmoreland—U; Rock outcrop—none assigned
Hydric soils: No

52F—Westmoreland-Rock outcrop complex, 50 to 80 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Hills on uplands
Position on the landform: Backslopes
Size of areas: 4 to 400 acres

Map Unit Composition

Note: The Westmoreland soil and Rock outcrop occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Westmoreland and similar soils: Typically 45 percent; ranging from about 40 to 50 percent
Rock outcrop: Typically 30 percent; ranging from about 10 to 50 percent

Typical Profile

Westmoreland

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

Subsoil:
5 to 29 inches—yellowish brown silty clay loam

Substratum:
29 to 43 inches—yellowish brown very channery clay loam; strong brown mottles
43 to 51 inches—yellowish brown extremely channery silty clay loam; gray mottles and black manganese coatings

Hard bedrock:
51 to 61 inches—yellowish brown, black, and gray limestone bedrock

Rock outcrop

This part of the map unit consists of outcrops of grayish hard limestone bedrock. The outcrops are a few inches to about 5 feet tall.

Minor Components

Dissimilar components:
- Frederick and Groseclose soils, which have more clay in the subsoil and are deeper to bedrock than the Westmoreland soil; in similar areas
- Marbie soils, which are moderately well drained; on colluvial footslopes and fans
- Monongahela soils, which are moderately well drained; on river terraces
- Opequon soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas
- Timberville soils, which are deeper to bedrock, are darker, and have thicker surface layers than the Westmoreland soil; in the bottoms of colluvial drainageways
- Allegheny soils, which are deeper to bedrock than the Westmoreland soil; on river terraces
- Berks soils, which are shallower to bedrock than the Westmoreland soil; in similar areas
- Bland and Faywood soils, which have more clay in the subsoil and are shallower to bedrock than the Westmoreland soil; in similar areas

Similar components:
- Wyrick soils, which are deeper to bedrock than the Westmoreland soil; on colluvial footslopes and fans
- Hagerstown soils, which have more clay in the subsoil than the Westmoreland soil; in similar areas
- Elliber soils, which have many chert rock fragments; in similar areas

Properties and Qualities of the Westmoreland Soil

Available water capacity: Low (about 5.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Deep (40 to 60 inches)
Depth to root-restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: High

Surface fragments: None
Parent material: Fine-loamy residuum weathered from limestone and shale

Use and Management Considerations

Cropland

- This map unit is unsuited to cropland.

Pasture

- This map unit is unsuited to pastureland.

Woodland

Suitability: Moderately suited to northern red oak and yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality, especially in areas on steeper slopes. A timber harvest plan should focus on the proper location of haul roads and skid trails, and careful attention should be given to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- Coarse textured soil layers increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- Because of the slope, the use of equipment in preparing sites for planting is not practical.

Building sites

- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.
- Because of rock outcrops, rock removal may be needed.
- Because of the depth to bedrock, the ease of excavation is greatly reduced and the difficulty in constructing foundations and installing utilities is increased.

Septic tank absorption fields

- Because of the limited depth to bedrock, the filtering capacity of the soil is reduced and the difficulty of proper installation of effluent distribution lines is greatly increased.
- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.
- Because of rock outcrops, special design of septic tank absorption fields is needed.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Special design for roads and streets is needed to prevent the structural damage caused by low soil strength.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- Because of rock outcrops, special design of the grade of local roads and streets and special consideration of their location are needed to minimize rock removal.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: Westmoreland—7s; Rock outcrop—8s
Virginia soil management group: Westmoreland—U; Rock outcrop—none assigned
Hydric soils: No

53B—Wheeling loam, 2 to 7 percent slopes, rarely flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Low stream terraces along the Middle and South Forks of the Holston River
Position on the landform: Treads
Size of areas: 5 to 75 acres

Map Unit Composition

Wheeling and similar soils: Typically 80 percent; ranging from about 70 to 90 percent

Typical Profile

Surface layer:
0 to 21 inches—dark yellowish brown loam

Subsoil:
21 to 48 inches—yellowish brown loam
48 to 65 inches—yellowish brown very fine sandy loam

Minor Components

Dissimilar components:
- Speedwell soils, which have a less developed subsoil and are more susceptible to flooding than the Wheeling soil; on floodplains
- Monongahela soils, which are moderately well drained and not susceptible to flooding; on intermediate to high river terraces
- Wyrick soils, which are not susceptible to flooding; on colluvial footslopes and fans
- Allegheny soils, which are not susceptible to flooding; on intermediate to high river terraces

Similar components:
- Ebbing soils, which are moderately well drained; in similar areas
- Soils that have gravelly surface layers, in similar areas

Soil Properties and Qualities

Available water capacity: High (about 11.0 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Rare
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low

Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay
- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.

Woodland

Suitability: Well suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- This soil is well suited to haul roads and log landings.
- This soil is well suited to equipment operations.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- This soil is unsuited to septic tank absorption fields because of the flooding.
- The rare flooding limits the absorption and proper treatment of effluent from septic systems, and rapidly moving floodwaters may damage some components of septic systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e

Virginia soil management group: A
Hydric soil: No

54A—Wolfgap fine sandy loam, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Floodplains along the North Fork of the Holston River
Position on the landform: Floodplain steps
Size of areas: 2 to 20 acres

Map Unit Composition

Wolfgap and similar soils: Typically 85 percent; ranging from about 80 to 90 percent

Typical Profile

Surface layer:
0 to 14 inches—dark brown fine sandy loam

Subsoil:
14 to 40 inches—dark yellowish brown loam

Substratum:
40 to 72 inches—brown fine sandy loam

Minor Components

Dissimilar components:
- Botetourt soils, which are moderately well drained, have a better developed subsoil than the Wolfgap soil, and are less susceptible to flooding; on low stream terraces
- Ingledove soils, which have a better developed subsoil and are less susceptible to flooding than the Wolfgap soil; on low stream terraces

Similar components:
- Lobdell and Sindion soils, which are moderately well drained; in similar areas

Soil Properties and Qualities

Available water capacity: High (about 10.4 inches)
Slowest saturated hydraulic conductivity: Moderately high (about 0.6 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: None
Drainage class: Well drained
Depth to seasonal water saturation: More than 6 feet
Flooding hazard: Occasional
Ponding hazard: None
Shrink-swell potential: Low
Runoff class: Low
Surface fragments: None
Parent material: Alluvium derived from limestone, sandstone, and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, grass-legume hay, and alfalfa hay

- Conservation measures that minimize the loss of crop productivity and protect the soil from scouring by floodwaters are needed.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.

Woodland

Suitability: Moderately suited to yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should focus on streamside management zones and stream crossings and should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.

Building sites

- Flooding may result in physical damage and costly repairs to buildings.
- This soil is unsuited to homesites, and special design of some structures may be needed to prevent damage from flooding.

Septic tank absorption fields

- Because of flooding, this soil is unsuited to septic tank absorption fields.

Local roads and streets

- Special design for roads and streets is needed to prevent the damage caused by flooding.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 1
Virginia soil management group: A
Hydric soil: No

55B—Wyrick-Marbie complex, 2 to 7 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 45 acres

Map Unit Composition

Note: The Wyrick and Marbie soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Wyrick and similar soils: Typically 50 percent; ranging from about 45 to 55 percent
Marbie and similar soils: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Wyrick

Surface layer:
0 to 12 inches—brown silt loam

Subsoil:
12 to 25 inches—yellowish brown silty clay loam; light yellowish brown masses of oxidized iron
25 to 49 inches—yellowish red silty clay; black iron-manganese masses and brownish yellow masses of oxidized iron
49 to 65 inches—yellowish red and brownish yellow silty clay

Marbie

Surface layer:
0 to 7 inches—dark yellowish brown silt loam

Subsoil:
7 to 18 inches—yellowish brown silt loam; black manganese coatings
18 to 41 inches—yellowish brown silt loam; brownish yellow masses of oxidized iron, light brownish gray iron depletions, and black manganese coatings
41 to 65 inches—strong brown silty clay loam; black manganese coatings

Minor Components

Dissimilar components:
- Clubcaf soils, which are poorly drained; on floodplains
- Maurertown soils, which are poorly drained; on low river terraces
- Sindion soils, which are moderately well drained; on floodplains
- Ingledove and Wheeling soils, which are well drained; on low river terraces
- Mongle and Ebbing soils, which are somewhat poorly drained and moderately well drained, respectively; on low river terraces
- Westmoreland soils, which are well drained and shallower to bedrock than the Wyrick and Marbie soils; on uplands
- Timberville soils, which are well drained, are susceptible to flooding, are darker than the Wyrick and Marbie soils, and have thicker surface layers; in the bottoms of drainageways and sinkholes
- Opequon soils, which are well drained and shallower to bedrock than the Wyrick and Marbie soils; on uplands
- Rock outcrops in similar areas

Similar components:
- Soils that have gravelly surface layers, in similar areas
- Monongahela soils, which are similar to the Marbie soil and are moderately well drained; on intermediate to high river terraces
- Frederick, Groseclose, and Hagerstown soils, which are similar to the Wyrick soil, are well drained, and have more clay in the subsoil; on uplands
- Watahala soils, which are similar to the Wyrick soil, are well drained, and have more clay and chert rock fragments; on uplands

Soil Properties and Qualities

Available water capacity: Wyrick—high (about 9.1 inches); Marbie—low (about 3.7 inches)
Slowest saturated hydraulic conductivity: Wyrick—moderately high (about 0.6 in/hr); Marbie—moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Wyrick—none; Marbie—18 to 36 inches to fragipan
Drainage class: Wyrick—well drained; Marbie—moderately well drained
Depth to seasonal water saturation: Wyrick—more than 6 feet; Marbie—about 24 to 48 inches
Water table kind: Wyrick—not applicable; Marbie—perched
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Wyrick—medium; Marbie—high
Surface fragments: None
Parent material: Fine-loamy colluvium derived from limestone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to corn, tobacco, and grass-legume hay; moderately suited to alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- These soils are well suited to haul roads and log landings.
- These soils are well suited to equipment operations.

Building sites

- Because of wetness, these soils are poorly suited to building site development.
- Because of the seasonal high water table, the period when excavations can be made is restricted and a higher degree of construction site development and building maintenance may be required.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The limited depth to a fragipan affects the ease of excavation and grading.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: All areas are prime farmland
Land capability class: 2e
Virginia soil management group: Wyrick—G; Marbie—W
Hydric soils: No

55C—Wyrick-Marbie complex, 7 to 15 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes and toeslopes
Size of areas: 2 to 45 acres

Map Unit Composition

Note: The Wyrick and Marbie soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Wyrick and similar soils: Typically 50 percent; ranging from about 45 to 55 percent
Marbie and similar soils: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Wyrick

Surface layer:
0 to 12 inches—brown silt loam

Subsoil:
12 to 25 inches—yellowish brown silty clay loam; light yellowish brown masses of oxidized iron
25 to 49 inches—yellowish red silty clay; black iron-manganese masses and brownish yellow masses of oxidized iron
49 to 65 inches—yellowish red and brownish yellow silty clay

Marbie

Surface layer:
0 to 7 inches—dark yellowish brown silt loam

Subsoil:
7 to 18 inches—yellowish brown silt loam; black manganese coatings
18 to 41 inches—yellowish brown silt loam; brownish yellow masses of oxidized iron, light brownish gray iron depletions, and black manganese coatings
41 to 65 inches—strong brown silty clay loam; black manganese coatings

Minor Components

Dissimilar components:
- Clubcaf soils, which are poorly drained; on floodplains
- Maurertown soils, which are poorly drained; on low river terraces
- Sindion soils, which are moderately well drained; on floodplains
- Ingledove and Wheeling soils, which are well drained; on low river terraces that can flood
- Mongle and Ebbing soils, which are somewhat poorly drained and moderately well drained, respectively; on low river terraces
- Westmoreland soils, which are well drained and shallower to bedrock than the Wyrick and Marbie soils; on uplands
- Timberville soils, which are well drained, are susceptible to flooding, are darker than the Wyrick and Marbie soils, and have thicker surface layers; in the bottoms of drainageways and sinkholes
- Opequon soils, which are well drained and shallower to bedrock than the Wyrick and Marbie soils; on uplands
- Rock outcrops in similar areas

Similar components:
- Soils that have gravelly surface layers, in similar areas
- Monongahela soils, which are similar to the Marbie soil and are moderately well drained; on intermediate to high river terraces
- Frederick, Groseclose, and Hagerstown soils, which are similar to the Wyrick soil, are well drained, and have more clay in the subsoil; on uplands
- Watahala soils, which are similar to the Wyrick soil, are well drained, and have more clay and chert rock fragments; on uplands

Soil Properties and Qualities

Available water capacity: Wyrick—high (about 9.1 inches); Marbie—low (about 3.7 inches)
Slowest saturated hydraulic conductivity: Wyrick—moderately high (about 0.6 in/hr); Marbie—moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Wyrick—none; Marbie—18 to 36 inches to fragipan
Drainage class: Wyrick—well drained; Marbie—moderately well drained
Depth to seasonal water saturation: Wyrick—more than 6 feet; Marbie—about 24 to 48 inches
Water table kind: Wyrick—not applicable; Marbie—perched

Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate
Runoff class: Wyrick—medium; Marbie—high
Surface fragments: None
Parent material: Fine-loamy colluvium derived from limestone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited
- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar
- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- These soils are well suited to haul roads and log landings.
- These soils are well suited to equipment operations.

Building sites

- Because of wetness, these soils are poorly suited to building site development.
- Because of the seasonal high water table, the period when excavations can be made is restricted and a higher degree of construction site development and building maintenance may be required.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required;

special building practices and designs may be required to ensure the safe performance of machinery.
- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The limited depth to a fragipan affects the ease of excavation and grading.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 3e
Virginia soil management group: Wyrick—G; Marbie—W
Hydric soils: No

55D—Wyrick-Marbie complex, 15 to 25 percent slopes

Setting

Major land resource area: Southern Appalachian Ridges and Valleys (MLRA 128)
Landform: Base of slopes of hills and areas in valleys
Position on the landform: Footslopes
Size of areas: 2 to 45 acres

Map Unit Composition

Note: The Wyrick and Marbie soils occur as areas so closely intermingled that they could not be separated at the scale selected for mapping.

Wyrick and similar soils: Typically 50 percent; ranging from about 45 to 55 percent
Marbie and similar soils: Typically 30 percent; ranging from about 25 to 35 percent

Typical Profile

Wyrick

Surface layer:
0 to 12 inches—brown silt loam

Subsoil:
12 to 25 inches—yellowish brown silty clay loam; light yellowish brown masses of oxidized iron

25 to 49 inches—yellowish red silty clay; black iron-manganese masses and brownish yellow masses of oxidized iron
49 to 65 inches—yellowish red and brownish yellow silty clay

Marbie

Surface layer:
0 to 7 inches—dark yellowish brown silt loam

Subsoil:
7 to 18 inches—yellowish brown silt loam; black manganese coatings
18 to 41 inches—yellowish brown silt loam; brownish yellow masses of oxidized iron, light brownish gray iron depletions, and black manganese coatings
41 to 65 inches—strong brown silty clay loam; black manganese coatings

Minor Components

Dissimilar components:
- Clubcaf soils, which are poorly drained; on floodplains
- Maurertown soils, which are poorly drained; on low river terraces
- Sindion soils, which are moderately well drained; on floodplains
- Ingledove and Wheeling soils, which are well drained; on low river terraces that can flood
- Mongle and Ebbing soils, which are somewhat poorly drained and moderately well drained, respectively; on low river terraces
- Westmoreland soils, which are well drained and shallower to bedrock than the Wyrick and Marbie soils; on uplands
- Timberville soils, which are well drained, are susceptible to flooding, are darker than the Wyrick and Marbie soils, and have thicker surface layers; in the bottoms of drainageways and sinkholes
- Opequon soils, which are well drained and shallower to bedrock than the Wyrick and Marbie soils; on uplands
- Rock outcrops in similar areas

Similar components:
- Soils that have gravelly surface layers, in similar areas
- Monongahela soils, which are similar to the Marbie soil and are moderately well drained; on intermediate to high river terraces
- Frederick, Groseclose, and Hagerstown soils, which are similar to the Wyrick soil, are well drained, and have more clay in the subsoil; on uplands
- Watahala soils, which are similar to the Wyrick soil, are well drained, and have more clay and chert rock fragments; on uplands

Soil Properties and Qualities

Available water capacity: Wyrick—high (about 9.1 inches); Marbie—low (about 3.7 inches)
Slowest saturated hydraulic conductivity: Wyrick—moderately high (about 0.6 in/hr); Marbie—moderately low (about 0.06 in/hr)
Depth class: Very deep (more than 60 inches)
Depth to root-restrictive feature: Wyrick—none; Marbie—18 to 36 inches to fragipan
Drainage class: Wyrick—well drained; Marbie—moderately well drained
Depth to seasonal water saturation: Wyrick—more than 6 feet; Marbie—about 24 to 48 inches
Water table kind: Wyrick—not applicable; Marbie—perched
Flooding hazard: None
Ponding hazard: None
Shrink-swell potential: Moderate

Runoff class: Wyrick—high; Marbie—very high
Surface fragments: None
Parent material: Fine-loamy colluvium derived from limestone and shale

Use and Management Considerations

Cropland

Suitability: Well suited to tobacco and grass-legume hay; moderately suited to corn and alfalfa hay

- Erosion-control practices are needed on the steeper slopes.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil erosion.
- Controlling tillage methods and timing, equipment types, tire flotation, number of trips of equipment to the field, and grazing of crop residues can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent soil crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- Through the long-term use of proper nutrient management practices, yields can become economically feasible and nutrient levels environmentally acceptable.

Pasture

Suitability: Well suited

- Effective pasture management practices include maintaining a mixture of forages, applying a system of pasture rotation, deferring grazing, controlling undesirable vegetation, and using proper stocking rates.
- Erosion control is needed when pastures are established.
- The rooting depth may be restricted by a dense soil layer; species adapted to shallow root zones and droughty conditions should be planted.

Woodland

Suitability: Well suited to northern red oak; moderately suited to yellow-poplar

- Proper planning of timber harvesting is essential for minimizing the potential negative impact to soil and water quality. A timber harvest plan should include general adherence to all applicable best management practices.
- Proper management of forests helps to increase economic and environmental benefits. A forest management plan should be developed to provide guidance in the utilization of woodland.
- The slope increases the hazard of erosion on haul roads and log landings.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and restricts the use of equipment for preparing sites for planting.

Building sites

- Because of wetness, these soils are poorly suited to building site development.
- Because of the seasonal high water table, the period when excavations can be made is restricted and a higher degree of construction site development and building maintenance may be required.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls; foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required; special building practices and designs are required to ensure the safe performance of machinery.

- Because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for effluent distribution lines.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from conventional septic tank absorption systems.
- The restricted permeability limits the absorption and proper treatment of effluent from conventional septic systems.

Local roads and streets

- The limited depth to a fragipan affects the ease of excavation and grading.
- Because of the slope, special design of local roads and streets is needed.
- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- The low bearing strength is unfavorable for supporting heavy loads; special design of local roads and streets is needed to prevent structural damage.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Prime farmland: Not prime farmland
Land capability class: 4e
Virginia soil management group: Wyrick—G; Marbie—W
Hydric soils: No

W—Water

This map unit is in the Southern Appalachian Ridges and Valleys (MLRA 128) and Blue Ridge (MLRA 130) major land resource areas. It consists of ponds, lakes, creeks, rivers, and reservoirs.

No interpretive groups are assigned to this map unit.

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 forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for agricultural waste management. 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 gravel, sand, reclamation material, 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.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

Richard Rhea, District Conservationist, Natural Resources Conservation Service, Washington County, Virginia, helped prepare this section.

Washington County has about 197,500 acres of farmland *(15)*. Of this acreage, approximately 44,350 acres is used for cropland, 87,750 acres is used for pasture, and 65,400 acres is woodland, farmsteads, farm roads, ponds, or wasteland.

Agriculture is the main industry in Washington County. According to the 2002 Census of Agriculture, the county ranks eighth in Virginia for total farm income and ranks second in number of farms. It ranks first in burley tobacco production, third in number of cattle and calves, and sixth in number of dairy cows.

The primary crops grown in the county are corn for silage and corn for grain, which make up about 3,600 acres. Approximately 1,900 acres of burley tobacco and about 39,190 acres of alfalfa and grass-legume hay grown in rotation with row crops make up the remainder of the cropland. About 200 acres of truck crops, orchards, and small grains are also produced in the county.

Most of the corn, alfalfa, and tobacco produced in the county is in areas of the well drained Frederick soils in the Middle and South Fork drainage areas. Crops grown on the steeper parts of the North Fork drainage area are on Ingledove and Botetourt soils on river terraces and on the steep Westmoreland soils.

Frederick soils are well suited to pasture. Weikert soils are droughty and limited for the use of pasture and hay production.

Erosion is the limiting factor affecting most of the soils in the county for row crops. The loss of topsoil through erosion reduces the productivity of the soil by limiting the water-holding capacity of the soil and the ability of the soil to retain plant nutrients.

Some important conservation practices used in Washington County are crop rotation (crops rotated between row crops and close-growing forage crops), stripcropping (alternating strips of row crops with close-growing forage crops), winter cover crops, grassed waterways, and filter strips.

Pasture erosion is a serious problem for many pastures in Washington County. Many pastures are overgrazed, thus limiting the vegetative cover and subjecting the soil to erosion.

Many pasture erosion problems can be solved by maintaining a better stand of vegetation on the soil surface. Controlled grazing, applications of fertilizer and lime, and better water distribution in order to reduce livestock travel distances are practices that can improve vegetation stands. A new concept of rotational grazing is growing in popularity in the county and will be a useful practice in the control of pasture erosion.

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, and the system of land capability classification used by the Natural Resources Conservation Service is explained.

Effective pasture management practices include maintaining a mixture of grasses and legumes, rotating pasture, deferring grazing, controlling undesirable vegetation, and using proper stocking rates *(17)*.

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 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 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification and Virginia Soil Management Group of map units in the survey area also are shown in the table.

The yields are based on VALUES—the Virginia Agronomic Land Use Evaluation System *(25)*. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

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

Realistic yield goals can be maintained over a long-term basis through proper nutrient management and other soil amendments such as lime. Applications of nitrogen and phosphorus from organic or inorganic forms should be done according to approved nutrient management practices and regulations.

Pasture yields are expressed in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

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

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

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The 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 forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit *(22)*. Only capability class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

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, 2e. 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 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, forestland, wildlife habitat, or recreation.

The capability classification of the soils in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Virginia Soil Management Groups

The Virginia Agronomic Land Use Evaluation System (VALUES) is a system that ranks soils for management and productivity. VALUES places each soil series in Virginia into one of 43 management groups. The format of the management groups, A through QQ, include the following soil characteristics—regional occurrence; parent material; landscape position or influence; solum thickness; dominant profile features, such as texture; available water capacity; and internal drainage. Yields that are both economically and environmentally feasible were assigned to each management group, based on yields of field trial crop data and research. The following paragraphs describe the soil management groups in Washington County.

Group A. The soils of this group formed in alluvial parent materials and are on nearly level and gently sloping floodplains or stream terraces which have watersheds that originate west of the Blue Ridge. These soils are deep or very deep and are medium textured throughout. They have a high available water capacity and are well drained.

Group G. The soils of this group formed in locally transported, medium textured sediments of either colluvial or alluvial origin that overlie a wide range of residual materials. These soils are in landscape positions that include footslopes and toeslopes, the heads of drainageways, depressions, narrow upland drainageways, and stream terraces. These deep and very deep soils are silty to loamy in the upper part of the subsoil, which is underlain with clayey to stony materials. They have a moderately high available water capacity and are moderately well drained or somewhat poorly drained.

Group H. The soils of this group formed in alluvium along streams or terraces. They are moderately deep to very deep, have silty to clay loam subsurface layers, and have a moderately high available water capacity. They are somewhat poorly drained or poorly drained, unless artificial drainage is provided. If artificial drainage is provided, the productive capacity of these soils is significantly increased.

Group L. The soils of this group formed from old transported deposits of alluvium or colluvium. These soils are common on stream terraces, footslopes, and older, elevated, upland landscapes that were once stream terraces. They are deep or very deep, have medium textured surface layers, have more clayey subsurface layers, and commonly contain gravel and rounded stones. They have a moderate or high available water capacity and typically are well drained.

Group M. The soils of this group formed in material weathered from carbonate rocks. These soils are on upland summits and side slopes. These deep or very deep soils have reddish brown, clayey subsurface layers that contain coarse fragments in some areas. They have a moderate available water capacity, unless the content of coarse fragments is significantly high, and they are well drained.

Group O. The soils of this group formed from transported materials ranging from mountain colluvium to old alluvium on dissected uplands and deposits on old elevated river terraces. These very deep to shallow soils have very dark red clayey subsurface layers, which have significant amounts of coarse fragments in some areas; have a moderate available water capacity; and are well drained.

Group U. The soils of this group formed from a variety of residual parent materials ranging from Triassic sediments to sandstone, shale, and limestone to colluvium from these materials. These very deep to shallow soils commonly have fine-loamy subsurface layers. They commonly have coarse fragments making up one-third of the soil volume and, as a result, have a moderate or moderately low available water capacity. They are well drained or moderately well drained.

Group W. The soils of this group formed from mixed colluvium. These soils are on stream terraces and footslopes. They have fragipans within the upper 3 feet and have loamy subsurface layers, which commonly contain coarse fragments. As a result, they have a moderately low available water capacity and are moderately well drained or somewhat poorly drained.

Group Y. The soils of this group formed from the residuum of weathered limestone, shale, or other carbonate-influenced rocks. These shallow to moderately deep soils represent upland landscapes. They have clayey subsurface layers, which contain coarse fragments in some areas, and have a moderate or low available water capacity where they are shallow to bedrock. They are mostly well drained.

Group CC. The soils of this group formed from a range of parent materials that include alluvium and colluvium. These soils occur on a variety of landscapes, including uplands, stream terraces, colluvial areas, and bottomlands. They commonly have a moderately deep solum, are very deep to bedrock, have clayey-skeletal to coarse-loamy subsurface layers (which have as much as 70 percent coarse fragments in some areas), and have a moderately low available water capacity. They are well drained.

Group FF. The soils of this group formed in sandstone and shale residual parent materials and mountain colluvium. These soils are on steeply dissected uplands and mountain side slopes. They are moderately shallow and mostly have loamy-skeletal subsurface layers, which may contain 80 percent, or more, coarse fragments. As a result, the available water capacity is low or very low. The soils are well drained or moderately well drained.

Group HH. The soils of this group formed from loamy sediments on floodplains. These soils are moderately deep to very deep, have fine-loamy or clayey subsurface layers, have a moderate available water capacity, and are somewhat poorly drained or moderately well drained.

Group JJ. The soils of this group formed from a wide variety of residual parent materials, ranging from sandstone, shale, and limestone to phyllite or schist. These soils are shallow to moderately deep, dominantly are loamy-skeletal throughout, and contain 30 to 70 percent coarse fragments. They have a very low available water capacity and are well drained.

Group NN. The soils of this group are undrained. These soils formed in alluvium along streams or on terraces. They are moderately deep to very deep, have silty to clay loam subsurface layers, have a moderately high available water capacity, and are somewhat poorly drained or poorly drained.

The management groups for the map units in the survey area are given in the section "Detailed Soil Map Units" and in table 5.

Prime Farmland

Table 6 lists the map units in the survey area that are considered prime farmland. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of prime farmland, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland 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 land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. 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 13,300 acres in the survey area meet the soil requirements for prime farmland. Scattered areas of this land are throughout Washington County, but most are along rivers and streams and at the base of slopes.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

For some of the soils listed in table 6, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

Hydric Soils

Table 7 lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site *(9, 10)*.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology *(6, 10, 12, 13)*. Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part *(7)*. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established *(8)*. These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” *(20)* and “Keys to Soil Taxonomy” *(19)* and in the “Soil Survey Manual” *(24)*.

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in “Field Indicators of Hydric Soils in the United States” *(9)*.

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The following map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

5B	Botetourt loam, 2 to 7 percent slopes, rarely flooded
11B	Ebbing loam, 2 to 7 percent slopes, rarely flooded
14B	Ernest silt loam, 2 to 7 percent slopes
14C	Ernest silt loam, 7 to 15 percent slopes
23C	Hayter loam, 7 to 15 percent slopes
23D	Hayter loam, 15 to 25 percent slopes
29A	Lobdell loam, 0 to 3 percent slopes, occasionally flooded
30C	Macove cobbly silt loam, 7 to 15 percent slopes, rubbly

30D	Macove cobbly silt loam, 15 to 25 percent slopes, rubbly
30E	Macove cobbly silt loam, 25 to 50 percent slopes, rubbly
31C	Macove very channery silt loam, 7 to 15 percent slopes
31D	Macove very channery silt loam, 15 to 25 percent slopes
31E	Macove very channery silt loam, 25 to 50 percent slopes
33A	Mongle loam, 0 to 3 percent slopes, rarely flooded
34B	Monongahela silt loam, 2 to 7 percent slopes
34C	Monongahela silt loam, 7 to 15 percent slopes
38A	Sindion silt loam, 0 to 3 percent slopes, occasionally flooded
40B	Tate loam, 2 to 7 percent slopes
40C	Tate loam, 7 to 15 percent slopes
40D	Tate loam, 15 to 25 percent slopes
41B	Timberville-Marbie complex, 2 to 7 percent slopes, frequently flooded
42C	Timberville-Marbie complex, 7 to 15 percent slopes, rarely flooded
43B	Tumbling loam, 2 to 7 percent slopes, very bouldery
43C	Tumbling loam, 7 to 15 percent slopes, very bouldery
43D	Tumbling loam, 15 to 25 percent slopes, very bouldery
44B	Tumbling loam, 2 to 7 percent slopes
44C	Tumbling loam, 7 to 15 percent slopes
44D	Tumbling loam, 15 to 25 percent slopes
44E	Tumbling loam, 25 to 45 percent slopes
55B	Wyrick-Marbie complex, 2 to 7 percent slopes
55C	Wyrick-Marbie complex, 7 to 15 percent slopes
55D	Wyrick-Marbie complex, 15 to 25 percent slopes

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Table 8, parts I through III, show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the table are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Overland flow of wastewater is a process in which wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves solids and nutrients on the vegetated surfaces as it flows downslope in a thin film. Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and the cation-exchange capacity affect absorption. Reaction, salinity, and the sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

Rapid infiltration of wastewater is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of pollution and the design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Forestland Productivity and Management

Harold Hannah, Regional Forester, Virginia Department of Forestry, Abingdon, Virginia, helped prepare this section.

Oak-hickory forests once covered most of Washington County. As the survey area was settled, the forests were cleared for agriculture and pasture. Soils of the fertile limestone valley, such as Frederick, Hagerstown, and Wyrick, were the prime agricultural soils. Eventually soils such as Westmoreland and Litz soils on steep knobs and Elliber and Tumbling soils on the lower slopes of the bigger mountains were included in the agricultural area. For the most part, only the rough, steep, and inaccessible soils, such as Lily, Dekalb, Drypond, and Weikert, remained in forests.

Around 1900, the need for lumber and wood products grew and the best timber was removed from all the remaining forests. A blight destroyed the American chestnut in the 1920’s and, at the same time, some agricultural land started reverting to forest. The light-seeded species, such as yellow-poplar, ash, black locust, maple, and pine, invaded the abandoned farmland and the areas once covered by American chestnut. Some of the areas dominated by limestone soils, such as Westmoreland, however, were primarily covered by eastern redcedar. This trend continued until about 1976. By this time, urban development began to reduce the acreage of forests and agricultural land.

In 1986, about 53 percent of Washington County was covered by forest. This forest contained mostly second-growth oak, hickory, yellow-poplar, and other hardwoods. White pine grows in the southern portion of the county and on the shale-limestone knobs, often in pure stands but also in mixtures with hardwoods. Southern yellow pines occur on the south-facing slopes in pure, old field stands and in scattered patches high on the south- and west-facing slopes, on the mountain and ridge soils such as Lily, Drypond, and Dekalb.

The quality of the trees tends to be excellent on Macove and Tumbling soils in moist coves and valleys and on north-facing soils, such as Lily and Dekalb soils, on the lower slopes. Tree quality is very poor on the dry, high ridgetops and west-facing slopes, which are dominated by Drypond and Lily soils. Tree quality in the survey area has been affected by wildfire and the high-grading type of harvest that periodically removed only the best stems of certain species. As a result, some areas contain a high percentage of trees not suitable for lumber.

The tables described in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forestland management.

Forestland Productivity

In table 9, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site 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 forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual" *(16)*, which is available at the local office of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Forestland Management

In table 10, parts I through V, interpretive ratings are given for various aspects of forestland management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified aspect of forestland management. *Well suited* indicates that the soil has features that are favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified management aspect. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified management aspect or that extreme measures are needed to overcome the undesirable soil properties.

Proper planning for timber harvesting is essential to minimize the potential impact to soil and water quality. A harvest plan should include logging roads, log decks, streamside management zones, stream crossings, skid trails, schedule of activities, and Best Management Practices (BMP's) for each activity. Forests should be managed to increase economic and environmental benefits. A forest stewardship plan should be developed to guide management and utilization of the woodlands.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual" *(16)*, which is available at the local office of the Natural Resources Conservation Service or on the Internet.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Wildlife Habitat

Thomas D. Smith, Soil Conservation Technician, Soil Conservation Service, Washington County, Virginia, prepared this section.

The Washington County Area has many species of wildlife. Black bear, white-tailed deer, raccoon, bobcat, wild turkey, ruffed grouse, gray squirrel, and fox squirrel are common in the upland wooded areas, especially on Tumbling, Macove, Lily, Weikert, Calvin, and Westmoreland soils. Cottontail rabbit, bobwhite quail, mourning dove, and woodcock are common on upland pastures and along cropfields throughout the county, especially on Frederick, Timberville, and Hagerstown soils. Mallard ducks, wood ducks, Canada geese, black ducks, and other diving and wading birds inhabit the wetland areas of Atkins, Maurertown, and Clubcaf soils during migration periods.

The North Fork, Middle Fork, and South Fork of the Holston Rivers contain smallmouth bass, walleye, muskellunge, chain pickerel, catfish, and rock bass. The South Holston Lake contains crappie, bluegill, smallmouth bass, largemouth bass, white bass, walleye, muskellunge, chain pickerel, catfish, and bait fish. Native brook trout and stocked rainbow trout and brown trout inhabit Tumbling Creek, Beaverdam Creek, White Top Laurel Creek, Green Cove Creek, and Brumley Creek.

An abundance of songbirds, most of which are migratory, inhabit Washington County. Birds of prey, such as owls and hawks, are common. A few bald eagles and osprey also have been sighted.

Recreational Development

Don Quesenberry, Recreation Director, Washington County, Virginia, helped prepare this section.

The survey area offers a limitless variety of recreational opportunities. Outdoor activities include hunting, fishing, and camping. Washington County has several scenic lakes and trails. Popular areas include Beartree Lake and Campground in the Mount Rogers National Recreation Area and the historical Virginia Creeper Trail, which has many trout streams. Both lie within portions of the Jefferson National Forest and close to the Appalachian Trail.

The Washington County Park on South Holston Lake offers boating, camping, swimming, and fishing. On Holston Lake, in the Alvarado area, is a boat launching facility. Hidden Valley and Clear Creek Lakes are also popular attractions.

Washington County and the Abingdon and Bristol Parks and Recreation Departments are dedicated to providing quality leisure activities to its residents on a year-round basis. These include fitness programs, youth and adult sports programs, educational courses (such as hunter safety), sports clinics, summer day camps for children, and special events. Agencies work closely with the school system and other community organizations in providing these services.

The annual Virginia Highlands Festival attracts thousands. It is expanding every year.

In table 11, parts I and II, the soils of the survey area are rated according to limitations that affect their suitability for recreational development. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table 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 also are important. Soils that are 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.

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

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 ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

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 data in the tables described under the heading "Soil Properties."

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 between the surface and a depth of 5 to 7 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 particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, reclamation material, roadfill, and topsoil; plan structures for water management; 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

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 12, parts I and II, show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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 soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 13, parts I and II, show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

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. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, 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. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid 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. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

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 the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 14, parts I and II, give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* 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 14, part I, only the likelihood 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 Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

In table 14, part II, the rating class terms are *good, fair,* and *poor* for reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, and topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

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 whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a 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 AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

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. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

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

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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. Embankments that have zoned construction (core and shell) are not considered. 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.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed *(21)*. 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 particle-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 are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Soil Properties

Table 16 gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

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 15 percent or more, 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 particle-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 particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

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

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

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

Physical Soil Properties

Table 17 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. The estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and 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 $^{1}/_{3}$- or $^{1}/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each 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 linear extensibility, 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. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in micrometers per second, 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 soil layer. The capacity varies, depending on soil properties that affect retention of water. 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.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, 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 by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. 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) and the Revised Universal Soil Loss Equation (RUSLE) 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 and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum 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.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook" *(18)*, which is available at the local office of the Natural Resources Conservation Service or on the Internet.

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

Chemical Soil Properties

Table 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil 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.

Water Features

Table 19 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a 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.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top *(upper limit)* and base *(lower limit)* of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 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); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

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.

Soil Features

Table 20 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for 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 to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes 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 or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete 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 also is 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 *(19, 20)*. 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 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve 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 Alfisol.

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 Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

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; type of saturation; 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 Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup 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 taxonomic class. 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 Hapludalfs.

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, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, semiactive, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. 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" *(24)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(20)* and in "Keys to Soil Taxonomy" *(19)*. Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Allegheny Series

Physiographic province: Valley and Ridge
Landform: Intermediate stream terraces in river valleys
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 15 percent

Associated Soils

- The moderately well drained Monongahela soils, on similar landforms
- Shottower soils, which have a fine particle size; on similar landforms
- Ingledove and Wheeling soils, which are susceptible to flooding; on low stream terraces
- Westmoreland soils, which are deep to bedrock; on uplands

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Allegheny loam, 2 to 7 percent slopes; 800 feet south of the intersection of the South Fork of the Holston River and Laurel Creek, 0.45 mile west-northwest of the intersection of Highway VA 715 and U.S. Route 58; Damascus, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 38 minutes 54 seconds N. and long. 81 degrees 49 minutes 58 seconds W.

Ap—0 to 10 inches; brown (10YR 4/3) loam; weak medium granular structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; few very fine pores; strongly acid; abrupt smooth boundary.

Bt1—10 to 22 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many very fine and fine pores; few faint clay films on all faces of peds; strongly acid; clear smooth boundary.

Bt2—22 to 42 inches; yellowish brown (10YR 5/6) gravelly sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; few very fine pores; few faint clay films on all faces of peds; many medium prominent black (10YR 2/1) manganese coatings; 25 percent well rounded sandstone gravel; strongly acid; clear smooth boundary.

Bt3—42 to 65 inches; yellowish brown (10YR 5/6) gravelly sandy clay loam; few medium distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; few very fine pores; few faint clay films on all faces of peds; many medium prominent black (10YR 2/1) manganese coatings; 30 percent well rounded sandstone gravel; strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches or more

Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 15 percent in the A horizon, 0 to 30 percent in the B horizon, and 0 to 35 percent in the C horizon
Reaction: Strongly acid to extremely acid

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 8
Texture—loam, silt loam, sandy clay loam, or clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam, fine sandy loam, sandy clay loam, or clay loam in the fine-earth fraction

Atkins Series

Physiographic province: Valley and Ridge
Landform: Floodplains along small creeks
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Poorly drained
Slowest saturated hydraulic conductivity: Moderately low
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- The moderately well drained Lobdell soils, on similar landforms
- The moderately well drained Ernest soils, on footslopes
- The well drained Tumbling soils, which have a fine particle size; on footslopes

Taxonomic Classification

Fine-loamy, mixed, active, acid, mesic Fluvaquentic Endoaquepts

Typical Pedon

Atkins loam, 0 to 3 percent slopes, frequently flooded; 0.66 mile west-southwest of the intersection of Highway VA 613 and the Smyth County line, 1.66 miles east-northeast of the intersection of Highways VA 613 and VA 747; Saltville, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 53 minutes 23 seconds N. and long. 81 degrees 48 minutes 48 seconds W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) loam; weak medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; common fine pores; 2 percent well rounded sandstone gravel; strongly acid; abrupt smooth boundary.
Bg—4 to 28 inches; grayish brown (2.5Y 5/2) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; common fine

pores; many medium prominent reddish brown (5YR 4/4) masses of oxidized iron; 5 percent well rounded sandstone gravel; strongly acid; clear wavy boundary.

Cg1—28 to 40 inches; gray (N 5/0) loam; massive; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; 10 percent well rounded sandstone gravel; strongly acid; clear smooth boundary.

Cg2—40 to 65 inches; gray (N 5/0) gravelly loam; massive; friable, slightly sticky, slightly plastic; 20 percent well rounded sandstone gravel; strongly acid.

Range in Characteristics

Solum thickness: 25 to 50 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 15 percent in the A and B horizons and 0 to 60 percent in the C horizon
Reaction: Strongly acid or very strongly acid above a depth of 40 inches; very strongly acid to moderately acid below a depth of 40 inches

Ap horizon:
Hue—10YR
Value—4 to 6
Chroma—1 or 2
Texture—loam

A horizon (if it occurs):
Hue—10YR
Value—2 or 3
Chroma—1
Texture—loam or silt loam in the fine-earth fraction

Bg horizon:
Hue—neutral or 10YR to 5Y
Value—4 to 6
Chroma—0 to 2
Texture—sandy loam, loam, or silty clay loam in the fine-earth fraction

Cg horizon:
Hue—neutral or 10YR to 5Y
Value—4 to 6
Chroma—0 to 2
Texture—sandy loam, loam, silt loam, or silty clay loam in the fine-earth fraction

Berks Series

Physiographic province: Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Channery, loamy residuum weathered from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Moderately deep
Slope range: 7 to 80 percent

Associated Soils

- Westmoreland soils, which are deep to bedrock; on similar landforms
- Weikert soils, which are shallow to bedrock; on similar landforms
- Hayter soils, which are very deep to bedrock; on footslopes
- The moderately well drained Ernest soils, which are very deep to bedrock; on footslopes

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Typical Pedon

Berks silt loam, 25 to 50 percent slopes; 0.44 mile southeast of the intersection of Highways VA 748 and VA 760, about 0.64 mile northeast of the intersection of Highways VA 750 and VA 751; Glade Spring, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 14 seconds N. and long. 81 degrees 47 minutes 11 seconds W.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable, slightly sticky, nonplastic; many very fine, fine, medium, and coarse roots; 10 percent angular shale channers; very strongly acid; abrupt smooth boundary.

Bw1—2 to 15 inches; yellowish brown (10YR 5/8) channery silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and medium roots; few faint silt coats on rock fragments and on all faces of peds; 20 percent angular shale channers; very strongly acid; clear smooth boundary.

Bw2—15 to 36 inches; yellowish brown (10YR 5/8) very channery silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; 55 percent angular shale channers; very strongly acid; clear smooth boundary.

R—36 inches; shale bedrock.

Range in Characteristics

Solum thickness: 12 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: 10 to 15 percent in the A horizon, 15 to 75 percent in the B horizon, and 35 to 90 percent in the C horizon
Reaction: Extremely acid to slightly acid

A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam

Ap horizon (if it occurs):
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—loam or silt loam in the fine-earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam, silt loam, or silty clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—loam or silt loam in the fine-earth fraction

Bland Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Residuum weathered from limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Moderately deep
Slope range: 15 to 50 percent

Associated Soils

- Westmoreland soils, which are deep to bedrock; on similar landforms
- Berks soils, which have a loamy-skeletal particle size; on similar landforms
- Opequon soils, which are shallow to bedrock; on similar landforms

Taxonomic Classification

Fine, mixed, semiactive, mesic Typic Hapludalfs

Typical Pedon

Bland silty clay loam, 25 to 50 percent slopes, rocky; 800 feet north-northwest of the intersection of U.S. Route 19 and the Russell County line, 200 feet east of the Russell County line; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 5 seconds N. and long. 82 degrees 6 minutes 59 seconds W.

A—0 to 5 inches; reddish brown (5YR 4/3) silty clay loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many fine and few medium and coarse roots; few fine pores; moderately acid; clear smooth boundary.

Bt1—5 to 11 inches; reddish brown (5YR 4/3) silty clay; many coarse prominent yellowish red (5YR 5/6) mottles; strong medium subangular blocky structure; friable, moderately sticky, moderately plastic; few fine, medium, and coarse roots; few fine and medium pores; common distinct clay films on all faces of peds; neutral; clear smooth boundary.

Bt2—11 to 24 inches; reddish brown (2.5YR 4/4) silty clay; strong coarse angular blocky structure; firm, moderately sticky, moderately plastic; few fine and medium roots; many fine and few medium and coarse pores; many prominent clay films on all faces of peds; neutral; abrupt smooth boundary.

R—24 inches; reddish brown (2.5YR 4/4) limestone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: 0 to 15 percent in the A and B horizons and 0 to 50 percent in the C horizon
Reaction: Strongly acid to neutral; reaction generally becomes less acid as depth increases

A horizon:
Hue—5YR
Value—3 to 5
Chroma—2 or 3
Texture—silty clay loam

Bt horizon:
Hue—2.5YR or 5YR
Value—3 or 4

Chroma—2 or 3
Texture—silty clay or clay

C horizon (if it occurs):
Hue—2.5YR or 5YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam to clay in the fine-earth fraction

Botetourt Series

Physiographic province: Valley and Ridge
Landform: Low stream terraces along the North Fork of the Holston River
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 7 percent

Associated Soils

- The well drained Ingledove soils, on similar landforms
- The somewhat poorly drained Mongle soils, on similar landforms
- The well drained Wolfgap soils, which are more susceptible to flooding than the Botetourt soils; on floodplains

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Ultic Hapludalfs

Typical Pedon

Botetourt loam, 2 to 7 percent slopes, rarely flooded; 0.39 mile west of the intersection of Highways VA 615 and VA 614, about 0.84 mile east-northeast of the intersection of Highway VA 614 and the Scott County line; Mendota, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 41 minutes 1 second N. and long. 82 degrees 19 minutes 21 seconds W.

Ap—0 to 8 inches; brown (10YR 4/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many medium roots; few medium pores; 2 percent well rounded sandstone cobbles; slightly acid; abrupt smooth boundary.

Bt1—8 to 23 inches; yellowish brown (10YR 5/8) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few medium roots; many medium and few coarse pores; few faint clay films on all faces of peds; slightly acid; clear smooth boundary.

Bt2—23 to 49 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; few medium roots; few medium pores; few prominent clay films on all faces of peds; few medium prominent light gray (10YR 7/2) iron depletions and many medium distinct strong brown (7.5YR 5/8) masses of oxidized iron; slightly acid; clear smooth boundary.

C—49 to 65 inches; light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) fine sandy loam; massive; firm, slightly sticky, slightly plastic; 3 percent well rounded sandstone gravel and 4 percent well rounded sandstone cobbles; slightly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches
Depth to bedrock: More than 60 inches

Rock fragments (kind, content): Well rounded sandstone gravel and cobbles; 0 to 15 percent in the A horizon, 0 to 35 percent in the B horizon, and 5 to 50 percent in the C horizon
Reaction: Strongly acid to slightly acid

Ap horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—loam

Bt horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—loam, sandy clay loam, or clay loam in the fine-earth fraction

BC horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—loam, sandy clay loam, or clay loam in the fine-earth fraction

C horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—sandy loam, fine sandy loam, loam, or clay loam in the fine-earth fraction

Calvin Series

Physiographic province: Valley and Ridge
Landform: Mountains on uplands
Parent material: Channery, loamy residuum weathered from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Moderately deep
Slope range: 7 to 65 percent

Associated Soils

- Westmoreland soils, which are deep to bedrock; on similar landforms
- Berks soils, which have yellower colors and more silt than the Calvin soils; on similar landforms
- Drypond soils, which are shallow to bedrock; on similar landforms
- Macove soils, which are very deep to bedrock and have a loamy-skeletal particle size; on footslopes

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Typical Pedon

Calvin silt loam, 25 to 50 percent slopes; in Bear Cove, 1.8 miles north of the intersection of Highways VA 689 and VA 687; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 43 seconds N. and long. 82 degrees 1 minute 46 seconds W.

A—0 to 6 inches; reddish brown (5YR 4/4) silt loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; common medium and many very fine roots; 5 percent angular shale channers; very strongly acid; abrupt smooth boundary.
Bw—6 to 21 inches; yellowish red (5YR 4/6) channery silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few medium and common very fine roots; 25 percent angular shale channers; very strongly acid; gradual smooth boundary.
C—21 to 29 inches; reddish brown (5YR 4/4) extremely channery silt loam; massive; firm, slightly sticky, slightly plastic; few coarse and common very fine roots; 80 percent angular shale channers; very strongly acid; abrupt wavy boundary.
R—29 inches; reddish brown (5YR 4/3) fine-grained, thinly bedded sandstone bedrock.

Range in Characteristics

Solum thickness: 20 to 35 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: 5 to 15 percent in the A horizon, 25 to 55 percent in B horizon, and 40 to 80 percent in the C horizon
Reaction: Very strongly acid to moderately acid

A horizon:
Hue—5YR or 7.5YR
Value—2 to 5
Chroma—2 to 4
Texture—silt loam

Bw horizon:
Hue—10R to 5YR
Value—4 or 5
Chroma—2 to 8
Texture—loam or silt loam in the fine-earth fraction

C horizon:
Hue—10R to 5YR
Value—3 to 5
Chroma—2 to 4
Texture—loam or silt loam in the fine-earth fraction

Clubcaf Series

Physiographic province: Valley and Ridge
Landform: Floodplains along small creeks
Parent material: Alluvium derived from limestone and shale
Drainage class: Poorly drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- The moderately well drained Sindion soils, on similar landforms
- The well drained Hayter and Wyrick soils, on footslopes
- The well drained Frederick and Westmoreland soils, on uplands

Taxonomic Classification

Fine-silty, mixed, active, mesic Cumulic Endoaquolls

Typical Pedon

Clubcaf silt loam, 0 to 3 percent slopes, frequently flooded; 1.5 miles south-southeast of the intersection of Highways VA 700 and VA 692, about 0.85 mile north-northwest of the intersection of Highways VA 692 and VA 695; Abingdon, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 44 minutes 53 seconds N. and long. 81 degrees 58 minutes 49 seconds W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine and common coarse roots; few very fine pores; few fine prominent strong brown (7.5YR 5/8) masses of oxidized iron; 2 percent rounded gravel; slightly acid; clear smooth boundary.

A—10 to 25 inches; very dark grayish brown (10YR 3/2) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and few coarse roots; few fine pores; few fine prominent strong brown (7.5YR 5/8) masses of oxidized iron; 2 percent rounded gravel; slightly acid; clear wavy boundary.

Bg—25 to 41 inches; very dark gray (N 3/0) loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few medium pores; common medium prominent yellowish brown (10YR 5/8) masses of oxidized iron; 5 percent rounded gravel; neutral; gradual wavy boundary.

Cg—41 to 65 inches; dark gray (5Y 4/1) very gravelly loam; massive; friable, slightly sticky, slightly plastic; few very fine roots; few medium pores; 40 percent rounded gravel; neutral.

Range in Characteristics

Solum thickness: 30 to 60 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Rounded gravel; 0 to 5 percent in the A and B horizons and 0 to 60 percent in the C horizon
Reaction: Moderately acid to moderately alkaline

Ap horizon:
Hue—10YR or 2.5Y
Value—2 or 3
Chroma—2 or 3
Texture—silt loam

A horizon:
Hue—10YR to 5Y
Value—2 or 3
Chroma—2 or 3
Texture—loam or silt loam

Bg horizon:
Hue—neutral or 10YR to 5Y
Value—2 or 3
Chroma—0 to 3
Texture—loam, silt loam, clay loam, or silty clay loam

Cg horizon:
Hue—neutral or 10YR to 5Y
Value—2 to 7
Chroma—0 to 4
Texture—loam, silt loam, silty clay loam, loamy sand, or sandy loam in the fine-earth fraction

Dekalb Series

Physiographic province: Valley and Ridge
Landform: Mountains on uplands
Parent material: Residuum weathered from sandstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Moderately deep
Slope range: 15 to 60 percent

Associated Soils

- Drypond soils, which are shallow to bedrock; on similar landforms
- Lily soils, which have a fine-loamy particle size; on similar landforms
- Westmoreland soils, which have a fine-loamy particle size and are deep to bedrock; on similar landforms
- Macove soils, which are very deep to bedrock; on footslopes

Taxonomic Classification

Loamy-skeletal, siliceous, active, mesic Typic Dystrudepts

Typical Pedon

Dekalb channery loam, 25 to 60 percent slopes; 0.9 mile south-southeast of the intersection of Highways VA 689 and VA 687, about 0.7 mile northeast of the intersection of Highways VA 687 and VA 611; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 48 minutes 0 seconds N. and long. 82 degrees 0 minutes 43 seconds W.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) channery loam; weak fine granular structure; friable, slightly sticky, slightly plastic; few medium and coarse roots; 20 percent angular sandstone channers; very strongly acid; clear smooth boundary.

Bw—2 to 21 inches; yellowish brown (10YR 5/4) channery loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common medium and coarse roots; 20 percent angular sandstone channers; very strongly acid; clear smooth boundary.

C—21 to 29 inches; yellowish brown (10YR 5/6) extremely channery sandy loam; massive; friable, slightly sticky, slightly plastic; few fine and medium roots; 70 percent angular sandstone channers; very strongly acid; abrupt smooth boundary.

R—29 inches; fine-grained sandstone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragments (type, content): Sandstone fragments, mostly channers and some flagstones; 15 to 35 percent in the A horizon, 20 to 60 percent in the B horizon, and 50 to 90 percent in the C horizon
Reaction: Extremely acid to strongly acid

A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam in the fine-earth fraction

B horizon:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—4 to 6
Texture—fine sandy loam or loam in the fine-earth fraction

C horizon:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—4 to 6
Texture—loamy sand or sandy loam in the fine-earth fraction

Drypond Series

Physiographic province: Valley and Ridge
Landform: Mountains on uplands
Parent material: Residuum weathered from sandstone and/or residuum weathered from quartzite
Drainage class: Excessively drained
Slowest saturated hydraulic conductivity: High
Depth class: Shallow
Slope range: 25 to 80 percent

Associated Soils

- Calvin and Dekalb soils, which are moderately deep to bedrock; on similar landforms
- Macove soils, which are very deep to bedrock; on footslopes
- Weikert soils, which are shallow to shale bedrock and have less sand than the Drypond soils; on similar landforms

Taxonomic Classification

Loamy-skeletal, siliceous, active, mesic Lithic Dystrudepts

Typical Pedon

Drypond channery loam, 50 to 80 percent slopes; 1.1 miles east-northeast of the intersection of Highways VA 687 and VA 689, about 1.1 miles northeast of the intersection of Highways VA 687 and VA 611; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 48 minutes 20 seconds N. and long. 82 degrees 0 minutes 34 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) channery loam; weak fine granular structure; friable, nonsticky, nonplastic; 20 percent angular sandstone channers; extremely acid; clear smooth boundary.
Bw—3 to 12 inches; light yellowish brown (10YR 6/4) channery loam; weak fine subangular blocky structure; friable, slightly sticky, nonplastic; 30 percent angular sandstone channers; very strongly acid; abrupt smooth boundary.
C—12 to 19 inches; yellowish brown (10YR 5/4) extremely channery loam; massive; friable, slightly sticky, nonplastic; 80 percent angular sandstone channers; very strongly acid; abrupt smooth boundary.
R—19 inches; sandstone bedrock.

Range in Characteristics

Solum thickness: 10 to 18 inches
Depth to bedrock: 10 to 20 inches
Rock fragments (kind, content): Sandstone gravel and channers; 15 to 35 percent in

the A horizon, 25 to 80 percent in the B horizon, and 45 to 90 percent in the C horizon
Reaction: Extremely acid or very strongly acid

A horizon:
Hue—10YR
Value—2 to 5
Chroma—1 to 4
Texture—loam in the fine-earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—4 to 8
Texture—sandy loam, loam, or sandy clay loam in the fine-earth fraction

C horizon:
Hue—5YR to 10YR
Value—3 to 5
Chroma—3 to 8
Texture—sandy loam or loam in the fine-earth fraction

Ebbing Series

Physiographic province: Valley and Ridge
Landform: Low stream terraces along the Middle and South Forks of the Holston River
Parent material: Fine-loamy alluvium derived from limestone, sandstone, and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately low
Depth class: Very deep
Slope range: 2 to 7 percent

Associated Soils

- The somewhat poorly drained Mongle soils, on similar landforms
- The well drained Wheeling soils, on similar landforms
- The well drained Speedwell soils, which are more susceptible to flooding than the Ebbing soils; on floodplains
- The well drained Wyrick soils, on footslopes

Taxonomic Classification

Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Ebbing loam, 2 to 7 percent slopes, rarely flooded; 0.4 mile northeast of the junction of Highways VA 731 and VA 714, about 1.4 miles southeast of the junction of Highways VA 91 and VA 731; Damascus, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 42 minutes 24 seconds N. and long. 81 degrees 45 minutes 21 seconds W.

Ap—0 to 14 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many medium roots; few medium pores; 2 percent rounded sandstone cobbles; moderately acid; abrupt smooth boundary.
Bt1—14 to 27 inches; yellowish brown (10YR 5/4) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few medium

roots; many medium and few coarse pores; few faint clay films on all faces of peds; 2 percent rounded sandstone gravel; strongly acid; clear smooth boundary.

Bt2—27 to 45 inches; brownish yellow (10YR 6/6) and reddish yellow (7.5YR 6/8) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; few distinct clay films on all faces of peds; many fine prominent light gray (10YR 7/2) iron depletions throughout; 2 percent rounded sandstone gravel; moderately acid; clear smooth boundary.

Cg—45 to 65 inches; light gray (N 7/0) loam; massive; friable, slightly sticky, slightly plastic; few fine roots; many medium prominent reddish yellow (7.5YR 6/8) masses of oxidized iron on faces of peds; 5 percent rounded sandstone gravel; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Rounded gravel and cobbles; 0 to 15 percent in the A horizon, 0 to 35 percent in the B horizon, and 5 to 50 percent in the C horizon
Reaction: Strongly acid to neutral in unlimed areas

Ap horizon:
Hue—10YR
Value—4
Chroma—3 or 4
Texture—loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, sandy clay loam, or clay loam in the fine-earth fraction

C horizon:
Hue—10YR, 2.5Y, or neutral
Value—5 to 8
Chroma—0 to 6
Texture—loam, fine sandy loam, silt loam, silty clay loam, sandy loam, or clay loam in the fine-earth fraction

Edneytown Series

Physiographic province: Blue Ridge
Landform: Hills and mountains on uplands
Parent material: Residuum weathered from granite and gneiss
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 7 to 35 percent

Associated Soils

- Pigeonroost soils, which are moderately deep to soft bedrock; on similar landforms
- Tate and Greenlee soils, which are very deep to bedrock; on footslopes
- Konnarock soils, which have a loamy-skeletal particle size; on similar landforms

Taxonomic Classification

Fine-loamy, mixed, active, mesic Typic Hapludults

Typical Pedon

Edneytown loam, 7 to 15 percent slopes; about 2.5 miles northwest of Fries, Virginia, about 0.75 mile northwest of the intersection of Highways VA 647 and VA 759, about 1.0 mile north of the intersection of Highways VA 646 and VA 648; Brierpatch Mountain, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 43 minutes 35 seconds N. and long. 81 degrees 0 minutes 58 seconds W.

Ap—0 to 4 inches; brown (10YR 4/3) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many very fine roots; few fine mica flakes; strongly acid; abrupt wavy boundary.

E—4 to 7 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine roots; few fine mica flakes; strongly acid; abrupt wavy boundary.

Bt—7 to 20 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common distinct clay films on all faces of peds; few fine mica flakes; strongly acid; clear wavy boundary.

BC—20 to 27 inches; strong brown (7.5YR 5/8) sandy loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine mica flakes; strongly acid; clear wavy boundary.

C1—27 to 44 inches; brownish yellow (10YR 6/6) loamy sand; massive; loose, nonsticky, nonplastic; few fine mica flakes; very strongly acid; gradual wavy boundary.

C2—44 to 62 inches; brownish yellow (10YR 6/8) loamy sand; massive; loose, nonsticky, nonplastic; few fine mica flakes; very strongly acid.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 15 percent throughout the profile
Reaction: Very strongly acid or strongly acid in unlimed areas

Ap horizon:
Hue—10YR
Value—3 to 6
Chroma—1 to 4
Texture—loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—loam, fine sandy loam, or sandy loam

Bt horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—4 to 8
Texture—clay loam or sandy clay loam

BC horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—6 to 8
Texture—sandy loam or sandy clay loam

C horizon:
Hue—7.5YR or 10YR
Value—5 to 8
Chroma—3 to 8
Texture—loam, fine sandy loam, sandy loam, or loamy sand

Elliber Series

Physiographic province: Valley and Ridge
Landform: Hills and mountains on uplands
Parent material: Gravelly colluvium over gravelly residuum weathered from cherty limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 7 to 65 percent

Associated Soils

- Lily soils, which are moderately deep to sandstone bedrock; on similar landforms
- Westmoreland soils, which are deep to limestone and shale bedrock; on similar landforms
- Weikert soils, which are shallow to shale bedrock; on similar landforms

Taxonomic Classification

Loamy-skeletal, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Elliber very gravelly silt loam, 7 to 15 percent slopes; 0.9 mile north of the intersection of Highways VA 689 and VA 80, about 1.3 miles west of the intersection of Highways VA 613 and VA 80; Hayters Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 50 minutes 54 seconds N. and long. 81 degrees 55 minutes 55 seconds W.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) very gravelly silt loam; weak fine granular structure; friable, nonsticky, nonplastic; common fine and medium and few coarse roots; common fine pores; 45 percent angular chert gravel; extremely acid; clear smooth boundary.

E—6 to 20 inches; pale brown (10YR 6/3) very gravelly silt loam; weak fine subangular blocky structure; friable, nonsticky, nonplastic; common fine and medium and few coarse roots; many fine pores; 50 percent angular chert gravel; very strongly acid; clear wavy boundary.

Bt1—20 to 38 inches; yellowish brown (10YR 5/8) very gravelly silt loam; weak coarse subangular blocky structure; friable, nonsticky, slightly plastic; few fine and medium roots; common fine pores; common distinct clay films on all faces of peds; 55 percent angular chert gravel; extremely acid; clear wavy boundary.

Bt2—38 to 49 inches; strong brown (7.5YR 5/8) very gravelly silty clay loam; weak coarse subangular blocky structure; friable, nonsticky, slightly plastic; few fine and medium roots; common fine pores; common distinct clay films on all faces of peds; 55 percent angular chert gravel; extremely acid; clear wavy boundary.

Bt3—49 to 65 inches; brownish yellow (10YR 6/8) extremely gravelly silt loam; weak coarse subangular blocky structure; friable, nonsticky, nonplastic; few fine roots; few fine pores; few faint clay films on all faces of peds; 60 percent angular chert gravel; extremely acid.

Range in Characteristics

Solum thickness: 40 to 80 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): White angular chert fragments; 35 to 60 percent in the A horizon and 40 to 80 percent in all other horizons; average of more than 50 percent in the upper 20 inches of the B horizon
Reaction: Extremely acid to strongly acid

Ap horizon (if it occurs):
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—loam or silt loam in the fine-earth fraction

A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam in the fine-earth fraction

E horizon:
Hue—7.5YR or 10YR
Value—6 or 7
Chroma—2 to 4
Texture—loam or silt loam in the fine-earth fraction

Bt horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—4 to 8
Texture—loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—3 to 6
Texture—sandy loam, loam, silt loam, or clay loam in the fine-earth fraction

Ernest Series

Physiographic province: Valley and Ridge
Landform: Valleys and the base of slopes of mountains
Parent material: Colluvium derived from sandstone and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately low
Depth class: Very deep
Slope range: 2 to 15 percent

Associated Soils

- The poorly drained Atkins soils, on floodplains
- Weikert soils, which are shallow to shale bedrock; on uplands
- Berks soils, which are moderately deep to shale bedrock; on uplands
- The well drained Hayter and Tumbling soils, on similar landforms

Taxonomic Classification

Fine-loamy, mixed, superactive, mesic Aquic Fragiudults

Typical Pedon

Ernest silt loam, 2 to 7 percent slopes; 2.8 miles northeast of the intersection of Highways VA 689 and VA 687, about 1.3 miles north-northeast of the intersection of Highways VA 611 and VA 692; Hayters Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 4 seconds N. and long. 81 degrees 57 minutes 30 seconds W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable, slightly sticky, slightly plastic; few very fine roots; few very fine pores; moderately acid; abrupt smooth boundary.

Bt1—9 to 18 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; few very fine pores; common faint clay films on all faces of peds; strongly acid; clear wavy boundary.

Bt2—18 to 30 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; few very fine pores; many faint clay films on all faces of peds; few fine distinct strong brown (7.5YR 5/8) masses of oxidized iron and common medium prominent light gray (10YR 7/1) iron depletions; strongly acid; clear wavy boundary.

Btxg1—30 to 38 inches; light brownish gray (10YR 6/2) silty clay loam; moderate coarse prismatic structure parting to moderate coarse angular blocky; firm, slightly sticky, slightly plastic; brittle; few very fine pores; common prominent silt coats on vertical faces of peds and many prominent clay films on vertical faces of peds; many medium prominent yellowish brown (10YR 5/8) masses of oxidized iron on faces of peds; 5 percent subangular shale channers; strongly acid; clear wavy boundary.

Btxg2—38 to 65 inches; light brownish gray (10YR 6/2) loam; weak coarse prismatic structure parting to weak coarse subangular blocky; very firm, slightly sticky, slightly plastic; brittle; few very fine pores; very few prominent clay films on vertical faces of peds and very few prominent silt coats on vertical faces of peds; many medium prominent yellowish brown (10YR 5/8) masses of oxidized iron on faces of peds; 5 percent subangular shale channers; strongly acid.

Range in Characteristics

Solum thickness: 36 to 60 inches or more
Depth to bedrock: More than 60 inches
Depth to fragipan: 20 to 36 inches
Rock fragments (kind, content): Shale, siltstone, and sandstone; 0 to 15 percent in the A horizon, 0 to 30 percent in the Bt horizon, 5 to 40 percent in the Btxg and Btx horizons, and 5 to 50 percent in the C horizon
Reaction: Dominantly very strongly acid or strongly acid; range includes moderately acid in the A horizon

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—silt loam or silty clay loam in the fine-earth fraction

Btxg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2
Texture—loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

Btx horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 7
Chroma—2 to 6
Texture—loam, silt loam, clay loam, silty clay loam, or silty clay in the fine-earth fraction

Faywood Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Residuum weathered from limestone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately low
Depth class: Moderately deep
Slope range: 7 to 60 percent

Associated Soils

- Opequon soils, which are shallow to limestone bedrock; on similar landforms
- Westmoreland soils, which are deep to limestone and shale bedrock; on similar landforms
- Hagerstown soils, which are deep to limestone bedrock; on similar landforms

Taxonomic Classification

Fine, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Faywood silt loam, 15 to 25 percent slopes; 1.9 miles east-northeast of the intersection of Highways VA 748 and VA 750, about 2.3 miles southeast of the intersection of Highways VA 91 and VA 745; Glade Spring, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 50 minutes 11 seconds N. and long. 81 degrees 45 minutes 37 seconds W.

A—0 to 4 inches; brown (10YR 4/3) silt loam; weak coarse granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; slightly acid; clear smooth boundary.
Bt1—4 to 17 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium subangular blocky structure; friable, moderately sticky, moderately plastic; common very fine and medium roots; many distinct clay films on all faces of peds; neutral; clear smooth boundary.
Bt2—17 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm, moderately sticky, slightly plastic; few fine roots;

many faint and few distinct clay films on all faces of peds; neutral; abrupt wavy boundary.
R—28 inches; thinly bedded limestone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragments (kind, content): Limestone flagstones and channers and some shale; 0 to 15 percent in the A and B horizons and 0 to 35 percent in the C horizon
Reaction: Strongly acid to slightly alkaline

A horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Ap horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or or silty clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silty clay loam, silty clay, or clay

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—silty clay loam, silty clay, or clay in the fine-earth fraction

Frederick Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Clayey residuum weathered from limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 45 percent

Associated Soils

- Watahala soils, which have a fine-loamy over clayey particle size and have more rock fragments in the upper part of the subsoil than the Frederick soils; on similar landforms
- Wyrick soils, which have a fine-loamy particle size; on footslopes
- The moderately well drained Marbie soils, on footslopes
- Timberville soils, which have less clay in the subsoil than the Frederick soils; on toeslopes
- Hagerstown soils, which are deep to limestone bedrock; on similar landforms

Taxonomic Classification

Fine, mixed, semiactive, mesic Typic Paleudults

Typical Pedon

Frederick silt loam, 7 to 15 percent slopes; 315 yards southwest of the intersection of Highways VA 906 and VA 676, about 0.4 mile east-southeast of the intersection of Highways VA 672 and VA 676; Abingdon, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 38 minutes 42 seconds N. and long. 81 degrees 57 minutes 20 seconds W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine and few medium roots; many fine pores; slightly acid; abrupt wavy boundary.

Bt1—9 to 25 inches; yellowish red (5YR 5/8) clay; common fine distinct brownish yellow (10YR 6/8) mottles; moderate fine subangular blocky structure; friable, moderately sticky, moderately plastic; common fine roots; many very fine and fine pores; common distinct clay films on all faces of peds; slightly acid; clear smooth boundary.

Bt2—25 to 42 inches; yellowish red (5YR 5/8) silty clay; many medium distinct brownish yellow (10YR 6/8) and many fine faint red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable, moderately sticky, moderately plastic; few fine roots; common very fine and fine pores; common distinct clay films on all faces of peds; few fine prominent black (10YR 2/1) manganese masses; moderately acid; gradual smooth boundary.

Bt3—42 to 70 inches; yellowish red (5YR 5/8) silty clay; few medium faint red (2.5YR 4/8) and many medium distinct brownish yellow (10YR 6/8) mottles; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; many fine pores; few faint clay films on all faces of peds; few fine prominent black (10YR 2/1) manganese masses; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Mostly chert but range includes siltstone, shale, and sandstone fragments; 0 to 60 percent in the A and E horizons and 0 to 35 percent in the B horizon
Reaction: Very strongly acid to moderately acid

Ap horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—1 to 4
Texture—loam or silt loam in the fine-earth fraction

E horizon (if it occurs):
Hue—7.5YR or 10YR
Value—5 to 7
Chroma—3 to 8
Texture—loam or silt loam in the fine-earth fraction

Bt horizon:
Hue—2.5YR or 5YR; upper part of horizon includes 7.5YR
Value—4 to 6
Chroma—4 to 8
Texture—silty clay loam, silty clay, or clay in the fine-earth fraction in the upper part of horizon; silty clay or clay in the fine-earth fraction in the lower part

BC horizon (if it occurs):
Hue—2.5YR to 10YR
Value—3 to 6
Chroma—3 to 8
Texture—silty clay or clay in the fine-earth fraction

Greenlee Series

Physiographic province: Blue Ridge
Landform: Valleys and the base of slopes of mountains
Parent material: Colluvium derived from rhyolite
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 7 to 35 percent

Associated Soils

- Pigeonroost soils, which have a fine-loamy particle size and are moderately deep to bedrock; on uplands
- Tate soils, which have a fine-loamy particle size and are very deep to bedrock; on similar landforms
- Konnarock soils, which have a loamy-skeletal particle size and are moderately deep to bedrock; on uplands
- Edneytown soils, which have a fine-loamy particle size and are very deep to bedrock; on uplands

Taxonomic Classification

Loamy-skeletal, mixed, semiactive, mesic Typic Dystrudepts

Typical Pedon

Greenlee very cobbly loam, 7 to 35 percent slopes, very stony; about 0.75 mile north of the intersection of Highways US 58 and VA 783, about 1.17 miles northeast of the intersection of Highways VA 362 and US 58; Park, North Carolina USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 37 minutes 14 seconds N. and long. 81 degrees 33 minutes 46 seconds W.

Oe—0 to 2 inches; moderately decomposed plant material.
A—2 to 7 inches; dark brown (10YR 3/3) very cobbly loam; moderate medium granular structure; friable; many fine and medium roots; 15 percent subrounded rhyolite gravel and 30 percent subrounded rhyolite cobbles; extremely acid; clear wavy boundary.
AB—7 to 14 inches; dark yellowish brown (10YR 4/4) very cobbly sandy loam; moderate fine granular structure; friable; common fine and medium roots; 15 percent subrounded rhyolite gravel and 30 percent subrounded rhyolite cobbles; very strongly acid; clear wavy boundary.
Bw1—14 to 39 inches; yellowish brown (10YR 5/4) very cobbly sandy loam; weak fine subangular blocky structure; friable; few fine roots; 10 percent subrounded

rhyolite gravel and 40 percent subrounded rhyolite cobbles; very strongly acid; gradual wavy boundary.

Bw2—39 to 53 inches; yellowish brown (10YR 5/4) very cobbly sandy loam; weak fine subangular blocky structure; friable; 15 percent subrounded rhyolite gravel and 45 percent subrounded rhyolite cobbles; very strongly acid; gradual wavy boundary.

C—53 to 62 inches; yellowish brown (10YR 5/4) extremely cobbly sandy loam; massive; very friable; 15 percent subrounded rhyolite gravel and 60 percent subrounded rhyolite cobbles; very strongly acid.

Range in Characteristics

Solum thickness: 20 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragment content: 35 to 60 percent in the solum and 35 to 80 percent in the substratum
Reaction: Extremely acid to moderately acid in unlimed areas

A horizon:
Hue—10YR or 7.5YR
Value—2 to 5
Chroma—1 to 4
Texture—loam in the fine-earth fraction

AB horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam, fine sandy loam, sandy loam, or sandy clay loam in the fine-earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam, fine sandy loam, sandy loam, or sandy clay loam in the fine-earth fraction

BC horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—loam, sandy loam, fine sandy loam, loamy fine sand, or loamy sand in the fine-earth fraction

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam, sandy loam, fine sandy loam, loamy sand, or sand in the fine-earth fraction

Groseclose Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Clayey residuum weathered from limestone and shale
Drainage class: Well drained

Slowest saturated hydraulic conductivity: Moderately low
Depth class: Very deep
Slope range: 7 to 75 percent

Associated Soils

- Litz soils, which have a loamy-skeletal particle size; on similar landforms
- Westmoreland soils, which have a fine-loamy particle size and are deep to limestone and shale bedrock; on similar landforms
- Wyrick soils, which have a fine-loamy particle size; on footslopes
- The moderately well drained Marbie soils, which have a fine-loamy particle size; on footslopes

Taxonomic Classification

Fine, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Groseclose silt loam in an area of Litz-Groseclose complex, 15 to 25 percent slopes; 500 feet northwest of the intersection of Highways VA 740 and VA 703, about 0.9 mile east-southeast of the intersection of Highways VA 779 and VA 694; Hayters Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 45 minutes 58 seconds N. and long. 81 degrees 54 minutes 22 seconds W.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; common fine pores; moderately acid; abrupt smooth boundary.
Bt—6 to 43 inches; yellowish brown (10YR 5/8) clay; weak coarse subangular blocky structure; friable, moderately sticky, moderately plastic; common fine roots; common fine pores; few faint clay films on all faces of peds; very strongly acid; clear wavy boundary.
C—43 to 65 inches; brownish yellow (10YR 6/8) clay loam; massive; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; very strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Chert, siltstone, and shale; 0 to 15 percent
Reaction: Extremely acid to strongly acid

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 8
Texture—silt loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 8
Texture—loam or silt loam

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—clay loam, silty clay loam, silty clay, or clay

BC horizon (if it occurs):
Hue—2.5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—clay loam, silty clay loam, silty clay, or clay

C horizon:
Hue—2.5YR to 10YR
Value—4 to 6
Chroma—3 to 8
Texture—silt loam, silty clay loam, clay loam, or clay

Hagerstown Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Residuum weathered from limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Deep
Slope range: 2 to 45 percent

Associated Soils

- Frederick soils, which are very deep to bedrock; on similar landforms
- Wyrick soils, which are very deep to bedrock; on footslopes
- The moderately well drained Marbie soils, which are very deep to bedrock; on footslopes
- Opequon soils, which are shallow to limestone bedrock; on similar landforms

Taxonomic Classification

Fine, mixed, semiactive, mesic Typic Hapludalfs

Typical Pedon

Hagerstown silt loam in an area of Hagerstown-Rock outcrop complex, 15 to 45 percent slopes; 0.5 mile southwest of the intersection of Highways VA 609 and VA 767; Glade Spring, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 46 minutes 23 seconds N. and long. 81 degrees 48 minutes 22 seconds W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable, slightly sticky, slightly plastic; common fine and few medium roots; few fine and medium pores; strongly acid; clear smooth boundary.
Bt—9 to 50 inches; strong brown (7.5YR 5/8) silty clay; many fine distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; common distinct clay films on all faces of peds; moderately acid; abrupt smooth boundary.
R—50 inches; limestone bedrock.

Range in Characteristics

Solum thickness: 40 to 60 inches
Depth to bedrock: 40 to 60 inches
Rock fragment content: 0 to 15 percent
Reaction: Strongly acid to slightly acid in the A horizon and the upper part of the B horizon and strongly acid to neutral in the lower part of the B horizon and in the C horizon

Ap horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

A horizon (if it occurs):
Hue—5YR to 10YR
Value—3
Chroma—2 to 4
Texture—loam or silt loam

Bt horizon:
Hue—2.5YR to 7.5YR
Value—4 or 5
Chroma—4 to 8
Texture—silty clay or clay; ranging to silty clay loam in the lower part of horizon

C horizon (if it occurs):
Hue—2.5YR to 10YR
Value—3 to 6
Chroma—4 to 8
Texture—loam, silt loam, clay loam, silty clay loam, silty clay, or clay

Hayter Series

Physiographic province: Valley and Ridge
Landform: Valleys and the base of slopes of hills
Parent material: Colluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 7 to 25 percent

Associated Soils

- Weikert soils, which have a loamy-skeletal particle size and are shallow to shale bedrock; on uplands
- Berks and Litz soils, which have a loamy-skeletal particle size and are moderately deep to shale bedrock; on uplands
- The moderately well drained Ernest soils, on similar landforms

Taxonomic Classification

Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Hayter loam, 7 to 15 percent slopes; 500 feet northwest of the intersection of Highways VA 674 and VA 670, about 1.2 miles southeast of the south end of Avens Bridge; Shady Valley, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 36 minutes 45 seconds N. and long. 81 degrees 57 minutes 14 seconds W.

Ap—0 to 11 inches; brown (10YR 4/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine and few medium roots; common fine pores; slightly acid; clear smooth boundary.

Bt1—11 to 40 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common fine pores; few distinct clay films on all faces of peds; 10 percent subrounded sandstone gravel; moderately acid; clear smooth boundary.

Bt2—40 to 65 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; few faint clay films on all faces of peds; 10 percent subrounded sandstone gravel; moderately acid.

Range in Characteristics

Solum thickness: 40 to 60 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Shale channers and sandstone gravel; 0 to 15 percent in the A horizon, 0 to 40 percent in the B horizon (with a weighted average of less than 35 percent), and 25 to 90 percent in the C horizon
Reaction: Strongly acid to slightly acid

Ap horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—2 to 6
Texture—loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—2 to 6
Texture—fine sandy loam, loam, or silt loam in the fine-earth fraction

BA horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—fine sandy loam or loam in the fine-earth fraction

Bt horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 to 8
Texture—loam, sandy clay loam, or clay loam in the fine-earth fraction

Ingledove Series

Physiographic province: Valley and Ridge
Landform: Low stream terraces along the North Fork of the Holston River
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 7 percent

Associated Soils

- The moderately well drained Botetourt soils, on similar landforms
- Wolfgap soils, which do not have an argillic horizon and are more susceptible to flooding than the Ingledove soils; on floodplains
- Allegheny soils, which are not susceptible to flooding; on higher level stream terraces

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Ultic Hapludalfs

Typical Pedon

Ingledove loam, 2 to 7 percent slopes, rarely flooded; 1.7 miles east of the intersection of Highway VA 614 and the Washington-Scott County line, 0.63 mile southwest of the intersection of Highways VA 615 and VA 614; Mendota, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 41 minutes 50 seconds N. and long. 82 degrees 18 minutes 58 seconds W.

Ap—0 to 13 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine roots; 5 percent rounded sandstone gravel and 5 percent rounded sandstone cobbles; moderately acid; clear smooth boundary.

Bt1—13 to 52 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable, moderately sticky, slightly plastic; few fine roots; few distinct clay films on all faces of peds; many fine prominent black (10YR 2/1) manganese masses; 1 percent rounded sandstone cobbles and 1 percent rounded sandstone gravel; moderately acid; gradual smooth boundary.

Bt2—52 to 65 inches; dark yellowish brown (10YR 4/6) clay loam; weak medium angular blocky structure; firm, moderately sticky, moderately plastic; common distinct clay films on all faces of peds; few fine distinct pale brown (10YR 6/3) iron-manganese masses, few fine prominent yellowish red (5YR 5/8) masses of oxidized iron, and many medium prominent black (10YR 2/1) manganese masses; moderately acid.

Range in Characteristics

Solum thickness: 30 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Rounded sandstone gravel and cobbles; 0 to 15 percent in the A horizon and the upper part of the B horizon and 0 to 60 percent in the lower part of the B horizon and in the C horizon
Reaction: Very strongly acid to neutral in the A horizon and the upper part of the B horizon and moderately acid to neutral in the lower part of the B horizon and in the C horizon

Ap horizon:
Hue—5YR to 10YR
Value—3 to 5
Chroma—3 or 4
Texture—loam

A horizon (if it occurs):
Hue—5YR to 10YR
Value—2 or 3
Chroma—2 or 3
Texture—sandy loam, fine sandy loam, loam, or silt loam

Bt horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 to 8
Texture—loam, sandy clay loam, or clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—5YR to 10YR

Value—4 or 5
Chroma—4 to 8
Texture—loamy sand, sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction

Konnarock Series

Physiographic province: Blue Ridge
Landform: Mountains on uplands
Parent material: Residuum weathered from metamorphic and sedimentary rock
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Moderately deep
Slope range: 7 to 70 percent

Associated Soils

- Pigeonroost soils, which have a fine-loamy particle size and are moderately deep to bedrock; on similar landforms
- Tate soils, which have a fine-loamy particle size and are very deep to bedrock; on footslopes
- Greenlee soils, which have a loamy-skeletal particle size and are very deep to bedrock; on footslopes
- Edneytown soils, which have a fine-loamy particle size and are very deep to bedrock; on similar landforms

Taxonomic Classification

Loamy-skeletal, mixed, semiactive, mesic Typic Dystrudepts

Typical Pedon

Konnarock channery silt loam, 15 to 25 percent slopes; 0.5 mile east of the intersection of U.S. Route 58 and Highway VA 600, about 0.6 mile east-southeast of the intersection of U.S. Route 58 and Highway VA 601; Grayson, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 37 minutes 16 seconds N. and long. 81 degrees 37 minutes 42 seconds W.

A—0 to 2 inches; dark grayish brown (10YR 4/2) channery silt loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; 20 percent channers; strongly acid; clear smooth boundary.
Bw—2 to 13 inches; strong brown (7.5YR 5/6) very channery loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; 40 percent channers; strongly acid; gradual smooth boundary.
C—13 to 23 inches; brown (7.5YR 5/4) very channery silt loam; massive; friable, slightly sticky, slightly plastic; few fine roots; 55 percent channers; strongly acid; abrupt smooth boundary.
R—23 inches; rhythmite bedrock.

Range in Characteristics

Solum thickness: 10 to 30 inches
Depth to bedrock: 20 to 40 inches
Rock fragments (kind, content): Tillite and rhythmite channers; 15 to 35 percent in the A horizon, 5 to 80 percent in the B horizon, and 40 to 95 percent in the C horizon
Reaction: Extremely acid to moderately acid

A horizon:
Hue—5YR to 10YR

Value—3 or 4
Chroma—2 to 4
Texture—silt loam in the fine-earth fraction

Ap horizon (if it occurs):
Hue—5YR to 10YR
Value—3 or 4
Chroma—2 to 4
Texture—loam or silt loam in the fine-earth fraction

Bw horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam or silt loam in the fine-earth fraction

C horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam or silt loam in the fine-earth fraction

Lily Series

Physiographic province: Valley and Ridge
Landform: Mountains on uplands
Parent material: Fine-loamy residuum weathered from sandstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Moderately deep
Slope range: 2 to 65 percent

Associated Soils

- Dekalb soils, which have a loamy-skeletal particle size; on similar landforms
- Drypond soils, which have a loamy-skeletal particle size and are shallow to sandstone bedrock; on similar landforms
- Macove soils, which have a loamy-skeletal particle size and are very deep to bedrock; on footslopes
- Weikert soils, which have a loamy-skeletal particle size and are shallow to shale bedrock; on similar landforms

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Typic Hapludults

Typical Pedon

Lily loam, 7 to 15 percent slopes, very stony; 2.5 miles north-northeast of the intersection of Highways VA 689 and VA 687, about 3.0 miles east-southeast of Hidden Valley Lake Dam; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 50 minutes 35 seconds N. and long. 82 degrees 1 minute 55 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine and few medium and coarse roots; extremely acid; clear smooth boundary.

Bt1—5 to 11 inches; dark yellowish brown (10YR 4/6) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many fine and common medium and coarse roots; few faint clay films on all faces of peds; 5 percent subangular sandstone gravel; very strongly acid; clear smooth boundary.

Bt2—11 to 24 inches; yellowish brown (10YR 5/8) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; few distinct clay films on all faces of peds; 10 percent subangular sandstone gravel; very strongly acid; abrupt smooth boundary.

R—24 inches; sandstone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragments (kind, content): Sandstone and quartzite fragments; 0 to 10 percent to a depth of 24 inches and 0 to 35 percent below a depth of 24 inches
Reaction: Extremely acid to strongly acid

A horizon:
Hue—10YR or 7.5YR
Value—2 to 5
Chroma—1 to 3
Texture—loam

E horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 4
Texture—sandy loam, fine sandy loam, or loam

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, sandy clay loam, or clay loam in the fine-earth fraction

BC horizon (if it occurs):
Hue—2.5YR to 10YR
Value—5 or 6
Chroma—4 to 8
Texture—loamy sand, sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—2.5YR to 10YR
Value—5 or 6
Chroma—4 to 8
Texture—loamy sand, sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction

Litz Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Residuum weathered from limestone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Moderately deep
Slope range: 7 to 80 percent

Associated Soils

- Groseclose soils, which have a fine particle size and are very deep to bedrock; on similar landforms
- Opequon soils, which have a clayey particle size and are shallow to limestone bedrock; on similar landforms
- Westmoreland soils, which have a fine-loamy particle size and are deep to limestone and shale bedrock; on similar landforms
- Hayter soils, which have a fine-loamy particle size and are very deep to bedrock; on footslopes

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Ruptic-Ultic Dystrudepts

Typical Pedon

Litz silt loam, 15 to 25 percent slopes; 1.2 miles northwest of the intersection of Highways VA 700 and VA 641, about 1.4 miles west of the intersection of Highways VA 627 and VA 700; Wallace, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 40 minutes 47 seconds N. and long. 82 degrees 14 minutes 41 seconds W.

A—0 to 2 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable, slightly sticky, nonplastic; many fine and common medium roots; 10 percent angular shale channers; strongly acid; clear smooth boundary.
Bw/Bt—2 to 13 inches; yellowish brown (10YR 5/4) very channery silt loam (Bw part) and strong brown (7.5YR 5/6) very channery silty clay loam (Bt part); weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; few distinct clay films; 40 percent angular shale channers; strongly acid; clear smooth boundary.
C—13 to 35 inches; yellowish brown (10YR 5/4) very channery silt loam; massive; friable, slightly sticky, slightly plastic; few fine roots; 55 percent angular shale channers; strongly acid; clear smooth boundary.
R—35 inches; olive (5Y 5/3) siltstone bedrock.

Range in Characteristics

Solum thickness: 10 to 30 inches
Depth to bedrock: 20 to 40 inches
Rock fragments (kind, content): Shale fragments; 5 to 15 percent in the A horizon and 35 to 90 percent in the B and C horizons
Reaction: Very strongly acid or strongly acid

A horizon:
Hue—5YR to 10YR
Value—3 to 6
Chroma—2 to 6
Texture—silt loam

Ap horizon (if it occurs):
Hue—5YR to 10YR
Value—4 to 6
Chroma—2 to 6
Texture—silt loam or silty clay loam in the fine-earth fraction

Bw/Bt horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 to 8

Texture—Bw part is loam or silt loam in the fine-earth fraction; Bt part is clay loam or silty clay loam in the fine-earth fraction

C horizon:
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—loam, silt loam, or silty clay loam in the fine-earth fraction

Cr horizon (if it occurs):
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—slightly weathered shale that crushes to loam, silt loam, clay loam, or silty clay loam in the fine-earth fraction

Lobdell Series

Physiographic province: Valley and Ridge
Landform: Floodplains along small creeks
Parent material: Fine-loamy alluvium derived from limestone, sandstone, and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- Ernest soils, which have have a fragipan; on footslopes
- The poorly drained Atkins soils, on floodplains
- Westmoreland soils, which are deep to limestone and shale bedrock; on uplands

Taxonomic Classification

Fine-loamy, mixed, active, mesic Fluvaquentic Eutrudepts

Typical Pedon

Lobdell loam, 0 to 3 percent slopes, occasionally flooded; 1.3 miles northeast of the intersection of Highways VA 689 and VA 80, about 0.5 mile southwest of the intersection of Highways VA 613 and VA 80; Hayters Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 50 minutes 53 seconds N. and long. 81 degrees 54 minutes 45 seconds W.

Ap—0 to 9 inches; dark brown (10YR 3/3) loam; weak medium granular structure; friable, slightly sticky, slightly plastic; many very fine and fine roots; common fine pores; moderately acid; clear smooth boundary.
Bw—9 to 23 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; many fine pores; moderately acid; clear wavy boundary.
BC—23 to 39 inches; dark yellowish brown (10YR 4/4) silt loam; massive; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; common medium distinct light brownish gray (2.5Y 6/2) iron depletions; moderately acid; clear wavy boundary.
Cg—39 to 65 inches; gray (5Y 5/1) loam; massive; friable, slightly sticky, nonplastic; 10 percent rounded sandstone gravel; moderately acid.

Range in Characteristics

Solum thickness: 25 to 50 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 5 percent in the A horizon and 0 to 15 percent in B and C horizons
Reaction: Strongly acid to neutral in the A and B horizons and moderately acid to neutral in the C horizon

Ap horizon:
Hue—7.5YR or 10YR
Value—2 to 4 (4 to 6 dry)
Chroma—1 to 3
Texture—loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—2 to 4 (4 to 6 dry)
Chroma—1 to 3
Texture—sandy loam, fine sandy loam, loam, or silt loam

Bw horizon:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—sandy loam, fine sandy loam, loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

BC horizon:
Hue—7.5YR to 2.5Y
Value—3 to 6
Chroma—3 to 6
Texture—sandy loam, fine sandy loam, loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

C horizon:
Hue—7.5YR to 5Y
Value—4 to 6
Chroma—1 to 8
Texture—sandy loam, loam, silt loam, sandy clay loam, or clay loam in the fine-earth fraction

Macove Series

Physiographic province: Valley and Ridge
Landform: Valleys and the base of slopes of mountains
Parent material: Colluvium derived from sandstone and siltstone and/or colluvium derived from quartzite
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Very deep
Slope range: 7 to 50 percent

Associated Soils

- Lily and Dekalb soils, which are moderately deep to sandstone bedrock; on uplands
- The poorly drained Atkins soils, which have a fine-loamy particle size and are susceptible to flooding; on floodplains

- The moderately well drained Ernest soils, which have a fine-loamy particle size; on similar landforms
- Tumbling soils, which have a fine particle size; on similar landforms

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Typic Hapludults

Typical Pedon

Macove cobbly silt loam, 25 to 50 percent slopes, rubbly; 1.5 miles northwest of the intersection of Highways VA 813 and VA 689, about 1.4 miles northwest of the intersection of Highways VA 689 and VA 688; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 48 minutes 59 seconds N. and long. 82 degrees 3 minutes 26 seconds W.

A—0 to 6 inches; brown (10YR 4/3) cobbly silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many medium and coarse roots; common fine pores; 3 percent subrounded sandstone stones, 5 percent subrounded sandstone gravel, and 12 percent subrounded sandstone cobbles; very strongly acid; clear smooth boundary.

E—6 to 13 inches; dark yellowish brown (10YR 4/4) cobbly silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots and many medium roots; common fine and few coarse pores; 3 percent subrounded sandstone stones, 5 percent subrounded sandstone gravel, and 12 percent subrounded sandstone cobbles; very strongly acid; clear smooth boundary.

Bt1—13 to 31 inches; reddish brown (5YR 4/4) very cobbly silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine and medium pores; few clay films on all faces of peds; 3 percent subrounded sandstone stones, 10 percent subrounded sandstone gravel, and 22 percent subrounded sandstone cobbles; very strongly acid; clear smooth boundary.

Bt2—31 to 65 inches; reddish brown (5YR 4/4) very stony loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; few fine pores; few clay films on all faces of peds; 5 percent subrounded sandstone gravel, 25 percent subrounded sandstone cobbles, and 25 percent subrounded sandstone stones; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Sandstone gravel, channers, cobbles, and stones; 15 to 60 percent in the A horizon, 15 to 40 percent in the E horizon, and 15 to 75 percent in the B horizon
Reaction: Very strongly acid or strongly acid

A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam in the fine-earth fraction

E horizon:
Hue—10YR
Value—4 or 5
Chroma—4 to 6
Texture—loam or silt loam in the fine-earth fraction

Bt horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 to 6
Texture—loam or silty clay loam in the fine-earth fraction

Marbie Series

Physiographic province: Valley and Ridge
Landform: Valleys and the base of slopes of hills
Parent material: Fine-loamy colluvium derived from limestone and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately low
Depth class: Very deep
Slope range: 2 to 25 percent

Associated Soils

- The well drained Wyrick soils, on similar landforms
- The well drained Frederick soils, which have a fine particle size; on uplands
- The well drained Timberville soils, on toeslopes

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Typic Fragiudults

Typical Pedon

Marbie silt loam in an area of Timberville-Marbie complex, 2 to 7 percent slopes, frequently flooded; 0.8 mile northeast of the intersection of Highways VA 80 and VA 609; Glade Spring, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 46 minutes 12 seconds N. and long. 81 degrees 50 minutes 58 seconds W.

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine roots; common fine pores; 5 percent angular chert gravel; strongly acid; abrupt smooth boundary.

Bt—7 to 18 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common fine pores; common faint clay films on all faces of peds; common fine prominent black (10YR 2/1) manganese coatings; 2 percent angular chert gravel; strongly acid; gradual smooth boundary.

Btx—18 to 41 inches; yellowish brown (10YR 5/4) silt loam; weak coarse prismatic structure parting to weak coarse platy; firm, slightly sticky, slightly plastic; brittle; many fine pores; common faint clay films on vertical faces of peds; common coarse distinct brownish yellow (10YR 6/6) masses of oxidized iron, common fine distinct light brownish gray (10YR 6/2) iron depletions, and many fine prominent black (10YR 2/1) manganese coatings; 2 percent angular chert gravel; strongly acid; gradual smooth boundary.

2Bt—41 to 65 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine pores; common distinct clay films on all faces of peds; many fine prominent black (10YR 2/1) manganese coatings; 2 percent angular chert gravel; strongly acid.

Range in Characteristics

Solum thickness: 40 to 72 inches or more
Depth to bedrock: More than 60 inches
Depth to fragipan: 18 to 36 inches

Rock fragments (kind, content): Chert, shale, siltstone, and fine-grained sandstone; 0 to 15 percent in the A and Bt horizons, 0 to 35 percent in the Btx horizon, and 0 to 25 percent in the 2Bt and 2C horizons
Reaction: Extremely acid to strongly acid

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—silt loam

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam, silt loam, clay loam, or silty clay loam

Btx horizon:
Hue—7.5YR to 2.5Y
Value—4 to 8
Chroma—2 to 8
Texture—loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

2Bt horizon:
Hue—2.5YR to 10YR
Value—4 to 7
Chroma—2 to 6
Texture—clay loam, silty clay loam, silty clay, or clay in the fine-earth fraction

2C horizon (if it occurs):
Hue—2.5YR to 2.5Y
Value—4 to 7
Chroma—2 to 6
Texture—loam, silt loam, silty clay loam, clay loam, silty clay, or clay in the fine-earth fraction

Maurertown Series

Physiographic province: Valley and Ridge
Landform: Low stream terraces in river valleys
Parent material: Clayey alluvium derived from limestone, sandstone, and shale
Drainage class: Poorly drained
Slowest saturated hydraulic conductivity: Low
Depth class: Very deep
Slope range: 0 to 2 percent

Associated Soils

- The somewhat poorly drained Mongle soils, on similar landforms
- The well drained Hayter and Wyrick soils, on footslopes
- The moderately well drained Ebbing soils, on similar landforms

Taxonomic Classification

Fine, mixed, semiactive, mesic Typic Endoaqualfs

Typical Pedon

Maurertown silt loam, 0 to 2 percent slopes, rarely flooded; 1.1 miles northwest of the junction of Highways VA 614 and VA 626, about 0.59 mile east-southeast of the North Fork Baptist Church; Hansonville, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 45 minutes 49 seconds N. and long. 82 degrees 9 minutes 3 seconds W.

Ap—0 to 7 inches; gray (10YR 5/1) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many medium roots; few very fine pores; moderately acid; abrupt smooth boundary.

Btg1—7 to 42 inches; gray (10YR 6/1) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; few fine pores; few faint clay films on all faces of peds; many coarse prominent yellowish brown (10YR 5/8) masses of oxidized iron throughout; moderately acid; clear smooth boundary.

Btg2—42 to 65 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few very fine pores; few faint clay films on all faces of peds; common coarse prominent yellowish brown (10YR 5/8) masses of oxidized iron on faces of peds; moderately acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 65 inches
Rock fragments (kind, content): Rounded gravel and cobbles; 0 to 15 percent in the A and B horizons and 10 to 35 percent in the C horizon
Reaction: Moderately acid to neutral

Ap horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silt loam

Btg horizon:
Hue—neutral or 10YR to 5Y
Value—4 to 6
Chroma—0 to 2
Texture—clay loam, silty clay loam, or silty clay

Cg horizon (if it occurs):
Hue—10YR to 5Y
Value—4 to 6
Chroma—1 or 2
Texture—clay loam, silty clay loam, or silty clay in the fine-earth fraction

Mongle Series

Physiographic province: Valley and Ridge
Landform: Low stream terraces in river valleys
Parent material: Fine-loamy alluvium derived from limestone, sandstone, and shale
Drainage class: Somewhat poorly drained
Slowest saturated hydraulic conductivity: Moderately high

Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- The moderately well drained Ebbing and Botetourt soils, on similar landforms
- The poorly drained Maurertown soils, which have a fine particle size; on similar landforms

Taxonomic Classification

Fine-loamy, mixed, active, mesic Aeric Endoaqualfs

Typical Pedon

Mongle loam, 0 to 3 percent slopes, rarely flooded; 0.7 mile east-northeast of the junction of Highways VA 687 and VA 611, about 1.0 mile west-southwest of the junction of Highways VA 611 and VA 692; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 47 minutes 44 seconds N. and long. 82 degrees 0 minutes 29 seconds W.

Ap—0 to 9 inches; brown (10YR 4/3) loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; common fine roots; few very fine pores; 1 percent rounded sandstone cobbles; neutral; clear smooth boundary.

Bt—9 to 20 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine and common very fine pores; few faint clay films on all faces of peds; few fine faint light brownish gray (10YR 6/2) iron depletions throughout and common fine prominent strong brown (7.5YR 5/8) masses of oxidized iron throughout; neutral; gradual wavy boundary.

Btg1—20 to 37 inches; gray (10YR 6/1) loam; weak coarse and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; few faint clay films on all faces of peds; few coarse prominent black (10YR 2/1) iron-manganese concretions on faces of peds and common fine prominent strong brown (7.5YR 5/8) masses of oxidized iron throughout; neutral; gradual wavy boundary.

Btg2—37 to 65 inches; gray (5Y 5/1) loam; weak coarse subangular blocky structure; friable, moderately sticky, slightly plastic; few fine roots; few very fine pores; few faint clay films on all faces of peds; many medium prominent strong brown (7.5YR 5/8) masses of oxidized iron on faces of peds and many coarse prominent black (10YR 2/1) iron-manganese concretions on faces of peds; 10 percent rounded sandstone cobbles; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Rounded gravel and cobbles; 0 to 15 percent in the Ap horizon, 0 to 35 percent in the B horizon, and 5 to 50 percent in the C horizon
Reaction: Strongly acid to neutral in unlimed areas

Ap horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—fine sandy loam, loam, or silt loam

Bt horizon:
Hue—10YR to 5Y
Value—4 to 6

Chroma—3 to 8
Texture—loam, clay loam, silty clay loam, or silt loam in the fine-earth fraction

Btg horizon:
Hue—10YR to 5Y
Value—4 to 6
Chroma—1 or 2
Texture—loam, clay loam, silty clay loam, or silt loam in the fine-earth fraction

BCg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—0 to 2
Texture—loam, clay loam, silty clay loam, or silt loam in the fine-earth fraction

Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 8
Chroma—0 to 2
Texture—sandy loam, fine sandy loam, loam, or clay loam in the fine-earth fraction

Monongahela Series

Physiographic province: Valley and Ridge
Landform: Intermediate stream terraces in river valleys
Parent material: Alluvium derived from sandstone and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately low
Depth class: Very deep
Slope range: 2 to 15 percent

Associated Soils

- The well drained Allegheny soils, on similar landforms
- The well drained Wheeling and Ingledove soils, which are susceptable to flooding; on low stream terraces
- Weikert soils, which are shallow to shale bedrock; on uplands

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Typic Fragiudults

Typical Pedon

Monongahela silt loam, 7 to 15 percent slopes; 0.3 mile west-southwest of the intersection of Highways VA 622 and VA 614, about 0.8 mile east of the intersection of Highways VA 621 and VA 614; Mendota, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 43 minutes 23 seconds N. and long. 82 degrees 15 minutes 9 seconds W.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam; weak coarse granular structure; friable, slightly sticky, slightly plastic; many very fine roots; few fine pores; strongly acid; abrupt smooth boundary.

Bt—10 to 27 inches; yellowish brown (10YR 5/8) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine roots; few fine pores; few distinct clay films on all faces of peds; strongly acid; clear wavy boundary.

Btx—27 to 65 inches; brownish yellow (10YR 6/6) silt loam; moderate coarse prismatic structure parting to weak coarse subangular blocky; firm, slightly sticky, slightly plastic; brittle; few very fine roots in cracks; few fine pores; common distinct clay films on vertical faces of peds; many medium distinct light gray (10YR 7/1) iron depletions; strongly acid.

Range in Characteristics

Solum thickness: 40 to 72 inches
Depth to bedrock: More than 60 inches
Depth to fragipan: 18 to 30 inches
Rock fragments (kind, content): Rounded sandstone gravel and cobbles; 0 to 15 percent in the A horizon, 0 to 30 percent in the Bt horizon, 0 to 35 percent in the Btx horizon, and 10 to 40 percent in the C horizon
Reaction: Very strongly acid or strongly acid

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, silt loam, sandy clay loam, silty clay loam, or clay loam in the fine-earth fraction

Btx horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—loam, silt loam, or clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 7
Chroma—2 to 8
Texture—sandy loam, loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

Opequon Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Clayey residuum weathered from limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Shallow
Slope range: 50 to 80 percent

Associated Soils

- Hagerstown soils, which are deep to limestone bedrock; on similar landforms
- Westmoreland soils, which have a fine-loamy particle size and are deep to limestone and shale bedrock; on similar landforms
- Faywood soils, which are moderately deep to bedrock; on similar landforms

Taxonomic Classification

Clayey, mixed, active, mesic Lithic Hapludalfs

Typical Pedon

Opequon silty clay loam in an area of Rock outcrop-Opequon complex, 50 to 80 percent slopes; 0.3 mile east-southeast of the intersection of Highway VA 80 and the North Fork of the Holston River; Hayters Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 5 seconds N. and long. 81 degrees 55 minutes 18 seconds W.

A—0 to 8 inches; brown (10YR 4/3) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few medium and coarse and many very fine roots; 10 percent gravel; neutral; clear smooth boundary.
Bt—8 to 14 inches; strong brown (7.5YR 5/6) silty clay; moderate medium and moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and few coarse roots; few distinct silt coats on rock fragments and on all faces of peds; 5 percent gravel; slightly acid; abrupt irregular boundary.
R—14 inches; limestone bedrock.

Range in Characteristics

Solum thickness: 12 to 20 inches
Depth to bedrock: 12 to 20 inches
Rock fragments (kind, content): Angular limestone fragments; 0 to 15 percent in the A horizon and 0 to 35 percent in the B horizon
Reaction: Strongly acid to moderately alkaline

A horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—1 to 4
Texture—silty clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—clay, silty clay loam, or silty clay in the fine-earth fraction

Pigeonroost Series

Physiographic province: Blue Ridge
Landform: Mountains on uplands
Parent material: Residuum weathered from graywacke and/or other igneous and metamorphic rocks
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Moderately deep
Slope range: 7 to 80 percent

Associated Soils

- Greenlee soils, which have a loamy-skeletal particle size and are moderately deep to bedrock; on footslopes
- Tate soils, which have a fine-loamy particle size and are very deep to bedrock; on footslopes

- Konnarock soils, which have a loamy-skeletal particle size and are moderately deep to bedrock; on uplands
- Edneytown soils, which have a fine-loamy particle size and are very deep to bedrock; on uplands

Taxonomic Classification

Fine-loamy, mixed, active, mesic Typic Hapludults

Typical Pedon

Pigeonroost loam, 15 to 25 percent slopes; 0.6 mile southwest of the intersection of Highways VA 600 and VA 777, about 0.6 mile south-southeast of the intersection of Highways VA 600 and VA 899; Grayson, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 36 minutes 54 seconds N. and long. 81 degrees 39 minutes 40 seconds W.

A—0 to 10 inches; dark brown (10YR 3/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; 5 percent gravel; strongly acid; clear smooth boundary.

Bt—10 to 23 inches; yellowish brown (10YR 5/8) loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; few distinct clay films on all faces of peds; 10 percent gravel; strongly acid; clear smooth boundary.

C—23 to 36 inches; yellowish brown (10YR 5/8) loam; massive; friable, slightly sticky, slightly plastic; common fine and medium roots; 10 percent gravel; strongly acid; clear smooth boundary.

Cr—36 to 60 inches; multicolored weathered felsite bedrock.

Range in Characteristics

Solum thickness: 16 to 39 inches
Depth to paralithic contact: 20 to 40 inches
Rock fragments (kind, content): Felsite, graywacke, and rhyolite; 0 to 15 percent
Reaction: Very strongly acid to moderately acid

A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—loam

Ap horizon (if it occurs):
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—sandy loam, fine sandy loam, or loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 6
Texture—loam, sandy clay loam, or clay loam

C horizon:
Color—multicolored
Texture—sandy loam, fine sandy loam, or loam saprolite

Cr horizon:
Color—multicolored

Texture—weathered felsite, graywacke, and rhyolite that is partly consolidated but can be dug with difficulty with a spade; the upper boundary is a paralithic contact

Shottower Series

Physiographic province: Valley and Ridge
Landform: High stream terraces in river valleys
Parent material: Clayey alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 25 percent

Associated Soils

- Allegheny soils, which have a fine-loamy particle size; on similar landforms
- Frederick soils on uplands
- The moderately well drained Monongahela soils, on similar landforms

Taxonomic Classification

Fine, kaolinitic, mesic Typic Paleudults

Typical Pedon

Shottower loam, 7 to 15 percent slopes; in hayland, 1.0 mile southwest of the intersection of Highways VA 664 and VA 670, about 0.53 mile east of the intersection of Highways VA 664 and VA 669; Shady Valley, Tennessee USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 36 minutes 54 seconds N. and long. 81 degrees 59 minutes 36 seconds W.

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; few fine and many very fine roots; many very fine vesicular pores; 1 percent rounded sandstone gravel; strongly acid; abrupt smooth boundary.

Bt1—8 to 21 inches; strong brown (7.5YR 4/6) clay loam; weak medium subangular blocky structure; friable, moderately sticky, slightly plastic; common very fine roots; common very fine vesicular pores; few faint clay films between sand grains; 1 percent rounded sandstone cobbles and 1 percent rounded sandstone gravel; moderately acid; gradual wavy boundary.

Bt2—21 to 29 inches; yellowish red (5YR 4/6) clay; few medium prominent yellow (10YR 7/8) mottles; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; common very fine vesicular pores; common distinct clay films on all faces of peds; 2 percent rounded sandstone gravel; moderately acid; clear wavy boundary.

Bt3—29 to 65 inches; red (2.5YR 4/6) gravelly clay; common coarse prominent yellow (10YR 7/8) mottles; moderate fine, medium, and coarse subangular blocky structure; friable, moderately sticky, slightly plastic; few very fine roots; few very fine vesicular pores; common prominent clay films on rock fragments and many prominent clay films on all faces of peds; 2 percent rounded sandstone cobbles and 30 percent rounded sandstone gravel; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Rounded sandstone and quartzite cobbles and

gravel; 0 to 15 percent in the A horizon, 0 to 35 percent in the B horizon, and 0 to 60 percent below a depth of 40 inches
Reaction: Very strongly acid to moderately acid

Ap horizon:
Hue—5YR or 10YR
Value—3 or 4
Chroma—3 or 4
Texture—loam

Bt horizon:
Hue—2.5YR to 7.5YR
Value—4 or 5
Chroma—6 to 8
Texture—clay loam, silty clay loam, clay, or silty clay in the fine-earth fraction

Sindion Series

Physiographic province: Valley and Ridge
Landform: Floodplains along major rivers and small creeks
Parent material: Alluvium derived from limestone and shale
Drainage class: Moderately well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- The poorly drained Clubcaf soils, on similar landforms
- The well drained Wheeling soils, on low stream terraces
- The well drained Speedwell and Wolfgap soils, on floodplains along major rivers

Taxonomic Classification

Fine-loamy, mixed, active, mesic Fluvaquentic Hapludolls

Typical Pedon

Sindion silt loam, 0 to 3 percent slopes, occasionally flooded; 0.3 mile south of the intersection of Highways VA 75 and VA 672, about 1.9 miles northeast of the intersection of Highways VA 75 and VA 670; Abingdon, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 39 minutes 11 seconds N. and long. 81 degrees 58 minutes 17 seconds W.

Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; few medium and common very fine roots; few fine pores; neutral; abrupt smooth boundary.
A—9 to 18 inches; dark brown (10YR 3/3) loam; weak medium and weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; few fine pores; moderately alkaline; abrupt smooth boundary.
Bw1—18 to 34 inches; very dark gray (10YR 3/1) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable, slightly sticky, slightly plastic; common fine and medium roots; common fine and few medium pores; few distinct silt coats on vertical faces of peds; moderately alkaline; gradual wavy boundary.
Bw2—34 to 46 inches; very dark grayish brown (10YR 3/2) clay loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine roots; few fine pores; common distinct silt coats on all faces of peds; many

medium distinct dark gray (N 4/0) iron depletions; moderately alkaline; gradual wavy boundary.

Cg—46 to 65 inches; dark gray (5Y 4/1) silty clay loam; massive; friable, slightly sticky, slightly plastic; few very fine roots; few fine and medium pores; few fine prominent dark bluish gray (5B 4/1) iron depletions and common fine prominent yellowish brown (10YR 5/6) masses of oxidized iron; moderately alkaline.

Range in Characteristics

Solum thickness: 30 to 50 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Rounded gravel and cobbles; 0 to 5 percent in the A horizon and 0 to 15 percent in the B and C horizons
Reaction: Slightly acid to moderately alkaline

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture—silt loam

A horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture—silt loam or loam

Bw horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—1 to 4
Texture—loam, silt loam, or clay loam

C horizon (if it occurs):
Hue—10YR to 5Y
Value—2 to 7
Chroma—3 or 4
Texture—sandy loam, loam, silt loam, silty clay loam, or clay loam

Cg horizon:
Hue—neutral or 7.5YR to 5Y
Value—2 to 7
Chroma—0 to 2
Texture—sandy loam, loam, silt loam, silty clay loam, or clay loam

Speedwell Series

Physiographic province: Valley and Ridge
Landform: Floodplains along the Middle and South Forks of the Holston River
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- The moderately well drained Ebbing soils, on low stream terraces

- The well drained Wheeling soils, on low stream terraces
- The moderately well drained Sindion soils, on floodplains

Taxonomic Classification

Fine-loamy, mixed, active, mesic Fluventic Hapludolls

Typical Pedon

Speedwell loam, 0 to 3 percent slopes, occasionally flooded; 1.3 miles east of the intersection of Highways VA 677 and VA 675, about 1.9 miles west-southwest of the intersection of U.S. Route 58 and Highway VA 708; Abingdon, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 40 minutes 37 seconds N. and long. 81 degrees 54 minutes 49 seconds W.

Ap—0 to 11 inches; dark brown (10YR 3/3) loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; neutral; clear smooth boundary.

Bw1—11 to 23 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; neutral; clear smooth boundary.

Bw2—23 to 36 inches; yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; neutral; clear smooth boundary.

Bw3—36 to 65 inches; yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few medium faint strong brown (7.5YR 5/6) masses of oxidized iron; neutral.

Range in Characteristics

Solum thickness: 30 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (size, content): Gravel and cobbles; 0 to 15 percent in the A and B horizons and 0 to 80 percent in the C horizon
Mica flakes: Few or common in some areas
Reaction: Slightly acid to moderately alkaline

Ap horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—sandy loam, fine sandy loam, loam, or silt loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 or 5; 2 or 3 in the upper part of horizon
Chroma—4 to 6; 2 to 4 in the upper part of horizon
Texture—loam, silt loam, sandy clay loam, clay loam, or silty clay loam

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 6

Texture—coarse sandy loam, sandy loam, loam, silt loam, sandy clay loam, or clay loam in the fine-earth fraction

Tate Series

Physiographic province: Blue Ridge
Landform: Valleys and the base of slopes of mountains
Parent material: Colluvium derived from rhyolite, rhythmite, tillite, and felsite
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 25 percent

Associated Soils

- Greenlee soils, which have a loamy-skeletal particle size and are moderately deep to bedrock; on footslopes
- Pigeonroost soils, which have a fine-loamy particle size and are moderately deep to bedrock; on uplands
- Konnarock soils, which have a loamy-skeletal particle size and are moderately deep to bedrock; on uplands
- Edneytown soils, which have a fine-loamy particle size and are very deep to bedrock; on uplands

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Tate loam, 7 to 15 percent slopes; 0.8 mile northeast of the intersection Highway VA 726 and U.S. Route 58, about 1.1 miles south of the intersection of U.S. Route 58 and Highway VA 601; Konnarock, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 40 minutes 58 seconds N. and long. 81 degrees 41 minutes 56 seconds W.

Ap—0 to 6 inches; dark brown (10YR 3/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine roots; common fine pores; 1 percent subrounded gravel; moderately acid; abrupt smooth boundary.

Bt1—6 to 28 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; common fine pores; few faint clay films on all faces of peds; 10 percent subrounded gravel; moderately acid; clear smooth boundary.

Bt2—28 to 65 inches; yellowish brown (10YR 5/8) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; few faint clay films on all faces of peds; 10 percent subrounded gravel; moderately acid.

Range in Characteristics

Solum thickness: 30 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 15 percent in the A horizon, 0 to 35 percent in the E and B horizons, and 15 to 35 percent in the C horizon
Reaction: Strongly acid to slightly acid

Ap horizon:
Hue—10YR
Value—3 to 6

Chroma—2 to 4
Texture—loam

E horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—fine sandy loam or loam in the fine-earth fraction

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, sandy clay loam, or clay loam in the fine-earth fraction

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loamy sand, sandy loam, or loam in the fine-earth fraction

Timberville Series

Physiographic province: Valley and Ridge
Landform: The base of slopes in valleys
Parent material: Alluvium and/or colluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 15 percent

Associated Soils

- The well drained Wyrick soils, on similar landforms
- The well drained Frederick soils, which have a fine particle size; on uplands
- The moderately well drained Marbie soils, on footslopes

Taxonomic Classification

Fine, mixed, active, mesic Typic Hapludults

Typical Pedon

Timberville silt loam in an area of Timberville-Marbie complex, 2 to 7 percent slopes, frequently flooded; 1.3 miles northeast of the intersection of Highways VA 737 and US 11, about 1.2 miles east of the intersection of Highways VA 609 and VA 737; Glade Spring, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 46 minutes 5 seconds N. and long. 81 degrees 49 minutes 30 seconds W.

Ap—0 to 10 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine and few medium roots; common fine pores; 2 percent chert gravel; moderately acid; clear smooth boundary.

Bw—10 to 31 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; many fine pores; 2 percent chert gravel; strongly acid; clear smooth boundary.

Btb1—31 to 38 inches; yellowish brown (10YR 5/8) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many fine and few medium pores; common distinct clay films on all faces of peds; 1 percent chert gravel; very strongly acid; gradual smooth boundary.

Btb2—38 to 51 inches; brownish yellow (10YR 6/8) silty clay loam; moderate coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine and medium pores; common distinct clay films on all faces of peds; few coarse prominent light gray (10YR 7/1) iron depletions, common fine distinct strong brown (7.5YR 5/6) masses of oxidized iron, and common fine prominent black (10YR 2/1) iron-manganese concretions; 10 percent chert gravel; very strongly acid; clear wavy boundary.

2Btb3—51 to 65 inches; strong brown (7.5YR 5/8) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few medium pores; common distinct clay films on all faces of peds; few medium prominent black (10YR 2/1) iron-manganese concretions, many fine prominent light gray (10YR 7/1) iron depletions, and many fine distinct red (2.5YR 4/8) masses of oxidized iron; 10 percent chert gravel; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Chert, sandstone, and shale; 0 to 15 percent in the A horizon and 0 to 35 percent in the B horizon
Reaction: Extremely acid to moderately acid

Ap horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 5
Texture—silt loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silt loam or silty clay loam in the fine-earth fraction

Ab horizon (if it occurs):
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—2 to 4
Texture—loam, silt loam, or silty clay loam in the fine-earth fraction

Btb horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, silt loam, clay loam, silty clay loam, or sandy clay loam in the fine-earth fraction

2Btb horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 to 8
Texture—clay loam, silty clay loam, clay, or silty clay in the fine-earth fraction

Tumbling Series

Physiographic province: Valley and Ridge
Landform: Valleys and the base of slopes of mountains and hills
Parent material: Clayey colluvium derived from sandstone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 45 percent

Associated Soils

- Macove soils, which have a loamy-skeletal particle size; on similar landforms
- The moderately well drained Ernest soils, which have a fine-loamy particle size; on similar landforms
- Weikert soils, which are shallow to shale bedrock; on uplands
- Lily soils, which are moderately deep to sandstone bedrock; on uplands

Taxonomic Classification

Fine, kaolinitic, mesic Typic Paleudults

Typical Pedon

Tumbling loam, 2 to 7 percent slopes, very bouldery; in pasture, 1.0 mile northeast of the intersection of Highways VA 687 and VA 689; Brumley, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 48 minutes 45 seconds N. and long. 82 degrees 0 minutes 52 seconds W.

Ap—0 to 6 inches; brown (10YR 4/3) loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine and few medium roots; few fine pores; 2 percent subrounded sandstone cobbles; moderately acid; abrupt smooth boundary.

Bt1—6 to 19 inches; strong brown (7.5YR 5/6) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and few medium roots; common fine pores; few faint clay films between sand grains; 2 percent subrounded sandstone cobbles; strongly acid; gradual smooth boundary.

Bt2—19 to 47 inches; yellowish red (5YR 5/6) clay; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many fine pores; few faint clay films on all faces of peds; 5 percent subrounded sandstone cobbles; strongly acid; gradual smooth boundary.

Bt3—47 to 65 inches; red (2.5YR 4/6) cobbly clay; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many fine pores; few faint clay films on all faces of peds; 25 percent subrounded sandstone cobbles; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Rock fragments (kind, content): Rounded or subrounded sandstone and quartzite gravel, cobbles, and stones; 0 to 15 percent in the A horizon and 0 to 35 percent in the B horizon
Reaction: Very strongly acid or strongly acid

A horizon (if it occurs):
Hue—5YR to 10YR
Value—2 or 3

Chroma—2 or 3
Texture—loam

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—loam

Bt horizon:
Hue—2.5YR to 7.5YR
Value—4 or 5
Chroma—4 to 8
Texture—sandy clay loam, clay loam, silty clay loam, or clay in the fine-earth fraction

Udorthents

Physiographic province: Valley and Ridge
Landform: Variable
Parent material: Fill material
Drainage class: Variable
Slowest saturated hydraulic conductivity: Unspecified
Depth class: Variable
Slope range: 0 to 55 percent

Associated Soils

- The well drained Wyrick soils, which have a fine-loamy particle size; on uplands
- The well drained Frederick soils, which have a fine particle size; on uplands
- The well drained Timberville soils, on toeslopes

Typical Pedon

The properties and characteristics of Udorthents vary to the extent that there is not a typical profile. Udorthents formed when soils were disturbed by land-leveling, excavation, or filling. They consist of loamy and clayey soil material and varying amounts of rock fragments. Depth to hard bedrock varies from a few inches to more than 5 feet. Areas range from slightly compacted to severely compacted. Unvegetated areas are susceptible to severe erosion. Drainage is variable.

Range in Characteristics

Solum thickness: A solum generally does not occur
Depth to bedrock: Variable
Rock fragment content: Variable
Reaction: Variable
Colors and textures: Variable

Watahala Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Gravelly residuum over clayey residuum weathered from cherty limestone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high

Depth class: Very deep
Slope range: 7 to 45 percent

Associated Soils

- Wyrick soils, which have a fine-loamy particle size; on footslopes
- Frederick soils, which have a fine particle size; on uplands
- Timberville soils, which have a fine-loamy particle size; on toeslopes

Taxonomic Classification

Fine-loamy over clayey, siliceous over mixed, subactive, mesic Typic Paleudults

Typical Pedon

Watahala very gravelly loam, 15 to 25 percent slopes; 0.5 mile northeast of the intersection of Highways VA 80 and VA 830; Glade Spring, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 48 minutes 0 seconds N. and long. 81 degrees 52 minutes 19 seconds W.

A—0 to 5 inches; brown (10YR 4/3) very gravelly loam; weak fine granular structure; friable, nonsticky, nonplastic; common fine and medium and few coarse roots; common fine pores; 5 percent angular chert cobbles and 35 percent angular chert gravel; very strongly acid; clear smooth boundary.

E—5 to 15 inches; yellowish brown (10YR 5/4) gravelly loam; weak fine and medium granular structure; very friable, slightly sticky, slightly plastic; common very fine and medium roots; 5 percent angular chert cobbles and 20 percent angular chert gravel; very strongly acid; clear wavy boundary.

BE—15 to 25 inches; yellowish brown (10YR 5/6) gravelly loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and medium roots; 5 percent angular chert cobbles and 20 percent angular chert gravel; very strongly acid; clear wavy boundary.

Bt1—25 to 30 inches; strong brown (7.5YR 5/6) gravelly silt loam; weak medium subangular blocky structure; friable, nonsticky, nonplastic; few fine and medium roots; few fine and medium pores; few faint silt coats on all faces of peds and common faint clay films on all faces of peds and bridges between sand grains; 5 percent angular chert cobbles and 20 percent angular chert gravel; very strongly acid; clear smooth boundary.

2Bt2—30 to 65 inches; yellowish red (5YR 5/8) clay; strong medium subangular blocky structure; friable, moderately sticky, very plastic; few fine roots; few fine and medium pores; many distinct clay films on all faces of peds; 5 percent angular chert gravel and 5 percent angular chert cobbles; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Depth to 2Bt horizon: 20 to 50 inches
Rock fragments (kind, content): Chert gravel and cobbles; 35 to 45 percent in the A horizon, 10 to 45 percent in the E, BE, and Bt horizons, and 0 to 35 percent in the 2Bt horizon
Reaction: Extremely acid to strongly acid in the A, E, BE, and Bt horizons and very strongly acid or strongly acid in the 2Bt horizon

A horizon:
Hue—10YR
Value—3 or 4

Chroma—2 to 4
Texture—loam

Ap horizon (if it occurs):
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—loam or silt loam in the fine-earth fraction

E horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 4
Texture—loam or silt loam in the fine-earth fraction

BE horizon:
Hue—10YR
Value—5 or 6
Chroma—4 to 6
Texture—loam or silt loam in the fine-earth fraction

Bt horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—6 to 8
Texture—loam or silt loam in the fine-earth fraction

2Bt horizon:
Hue—2.5YR to 7.5YR
Value—4 to 6
Chroma—6 to 8
Texture—silty clay or clay in the fine-earth fraction

Weikert Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Channery, loamy residuum weathered from shale and siltstone
Drainage class: Well drained
Slowest saturated hydraulic conductivity: High
Depth class: Shallow
Slope range: 15 to 80 percent

Associated Soils

- Berks soils, which are moderately deep to bedrock; on similar landforms
- Hayter soils, which have a fine-loamy particle size and are very deep to bedrock; on footslopes
- The moderately well drained Ernest soils, which have a fine-loamy particle size and are very deep to bedrock; on footslopes

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Lithic Dystrudepts

Typical Pedon

Weikert silt loam, 15 to 25 percent slopes; 1.3 miles east of the intersection of U.S. Route 58 and Highway VA 708, about 1.6 miles southwest of the intersection of

Highways VA 91 and VA 708; Damascus, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 40 minutes 1 second N. and long. 81 degrees 50 minutes 16 seconds W.

A—0 to 2 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; 10 percent shale channers; very strongly acid; clear smooth boundary.
Bw—2 to 15 inches; yellowish brown (10YR 5/4) very channery silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and medium roots; few faint silt coats on rock fragments and on all faces of peds; 55 percent shale channers; very strongly acid; gradual wavy boundary.
C—15 to 19 inches; yellowish brown (10YR 5/8) extremely channery silt loam; massive; friable, slightly sticky, slightly plastic; few fine roots; 80 percent shale channers; very strongly acid; abrupt wavy boundary.
R—19 inches; olive brown (2.5Y 4/4) fractured shale bedrock.

Range in Characteristics

Solum thickness: 8 to 20 inches
Depth to bedrock: 10 to 20 inches
Rock fragments (kind, content): Shale, siltstone, and sandstone; 5 to 15 percent in the A horizon, 35 to 60 percent in the B horizon, and 60 to 85 percent in the C horizon
Reaction: Very strongly acid to moderately acid

A horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

Ap horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam in the fine-earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—loam or silt loam in the fine-earth fraction

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam or silt loam in the fine-earth fraction

Westmoreland Series

Physiographic province: Valley and Ridge
Landform: Hills on uplands
Parent material: Fine-loamy residuum weathered from limestone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high

Depth class: Deep
Slope range: 7 to 80 percent

Associated Soils

- Berks soils, which have a loamy-skeletal particle size and are moderately deep to shale bedrock; on similar landforms
- Hayter soils, which are very deep to bedrock; on footslopes
- Opequon soils, which have a clayey particle size and are shallow to limestone bedrock; on similar landforms
- Groseclose soils, which have a fine particle size and are very deep to limestone bedrock; on similar landforms

Taxonomic Classification

Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Westmoreland silt loam, 25 to 50 percent slopes, rocky; 0.8 mile northwest of the intersection of Highways VA 700 and VA 611; Wyndale, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 44 minutes 49 seconds N. and long. 82 degrees 5 minutes 7 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine and medium and few coarse roots; few fine pores; 5 percent shale channers; strongly acid; clear smooth boundary.

Bt—5 to 29 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and few medium and coarse roots; few fine and medium pores; common faint clay films on all faces of peds; 10 percent shale channers; strongly acid; clear smooth boundary.

C1—29 to 43 inches; yellowish brown (10YR 5/8) very channery clay loam; common fine distinct strong brown (7.5YR 5/6) mottles; massive; friable, slightly sticky, slightly plastic; few fine roots; few silt coats; 50 percent shale channers; moderately acid; clear smooth boundary.

C2—43 to 51 inches; yellowish brown (10YR 5/8) extremely channery silty clay loam; many medium prominent gray (10YR 5/1) mottles; massive; friable, slightly sticky, moderately plastic; few fine roots in cracks; common medium prominent black (10YR 2/1) manganese coatings around rock fragments; 70 percent shale channers; moderately acid; clear smooth boundary.

R—51 inches; gray (10YR 5/1), black (10YR 2/1), and yellowish brown (10YR 5/8) thinly bedded limestone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 40 to 60 inches
Rock fragments (kind, content): Limestone, siltstone, and shale; 2 to 15 percent in the A horizon, 2 to 30 percent in the B horizon, and 45 to 90 percent in the C horizon
Reaction: Very strongly acid to moderately acid in the A and B horizon and strongly acid or moderately acid in the C horizon

A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam

Ap horizon (if it occurs):
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam or silty clay loam in the fine-earth fraction

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—loam, silt loam, silty clay loam, or clay loam in the fine-earth fraction

Wheeling Series

Physiographic province: Valley and Ridge
Landform: Low stream terraces along the Middle and South Forks of the Holston River
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 2 to 7 percent

Associated Soils

- The well drained Speedwell soils, which are more susceptible to flooding than the Wheeling soils; on floodplains
- The moderately well drained Ebbing soils, on similar landforms
- The somewhat poorly drained Mongle soils, on similar landforms
- The poorly drained Maurertown soils, on similar landforms

Taxonomic Classification

Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Wheeling loam, 2 to 7 percent slopes, rarely flooded; 0.3 mile east-northeast of the intersection of Highways VA 762 and VA 604, about 0.2 mile northeast of the intersection of Highway VA 604 and the South Fork of the Holston River; Konnarock, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 44 minutes 33 seconds N. and long. 81 degrees 41 minutes 18 seconds W.

Ap—0 to 21 inches; dark yellowish brown (10YR 4/4) loam; weak medium granular structure; friable, slightly sticky, slightly plastic; many fine roots; strongly acid; abrupt smooth boundary.
Bt1—21 to 35 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; common distinct clay films on all faces of peds; moderately acid; gradual smooth boundary.
Bt2—35 to 48 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots;

many distinct clay films on all faces of peds; moderately acid; gradual smooth boundary.

BC—48 to 65 inches; yellowish brown (10YR 5/6) very fine sandy loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; moderately acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (size, content): Gravel and cobbles; 0 to 15 percent in the A horizon and the upper part of the B horizon and 0 to 80 percent in the lower part of the B horizon and in the C horizon
Reaction: Strongly acid or moderately acid

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam, silt loam, or silty clay loam in the fine-earth fraction

BC horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—sandy loam or very fine sandy loam in the fine-earth fraction

C horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—stratified; ranging from sand to loam in the fine-earth fraction

Wolfgap Series

Physiographic province: Valley and Ridge
Landform: Floodplains along the North Fork of the Holston River
Parent material: Alluvium derived from limestone, sandstone, and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high
Depth class: Very deep
Slope range: 0 to 3 percent

Associated Soils

- The moderately well drained Botetourt soils, which are less susceptiable to flooding than the Wolfgap soils; on low stream terraces
- The well drained Ingledove soils, which are less susceptiable to flooding than the Wolfgap soils; on low stream terraces

Taxonomic Classification

Fine-loamy, siliceous, active, mesic Fluventic Hapludolls

Typical Pedon

Wolfgap fine sandy loam, 0 to 3 percent slopes, occasionally flooded; 1.6 miles east of the intersection of Highways VA 80 and VA 689, about 1.5 miles northeast of the intersection of Highways VA 80 and VA 611; Hayters Gap, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 49 minutes 58 seconds N. and long. 81 degrees 54 minutes 30 seconds W.

Ap—0 to 14 inches; dark brown (10YR 3/3) fine sandy loam, brown (10YR 5/3) dry; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; neutral; clear smooth boundary.
Bw—14 to 40 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; moderately alkaline; diffuse smooth boundary.
C—40 to 72 inches; brown (10YR 4/3) fine sandy loam; massive; friable, slightly sticky, slightly plastic; few fine roots; moderately alkaline.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragments (size, content): Gravel and cobbles; 0 to 15 percent in the A horizon and 0 to 35 percent in the B and C horizons
Reaction: Slightly acid to moderately alkaline

Ap horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—fine sandy loam

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—sandy loam, fine sandy loam, or silt loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—loam, silt loam, sandy clay loam, or clay loam in the fine-earth fraction

C horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 6
Texture—loamy sand, sandy loam, fine sandy loam, loam, silt loam, sandy clay loam, or clay loam in the fine-earth fraction; commonly stratified

Wyrick Series

Physiographic province: Valley and Ridge
Landform: Valleys and the base of slopes of hills
Parent material: Fine-loamy colluvium derived from limestone and shale
Drainage class: Well drained
Slowest saturated hydraulic conductivity: Moderately high

Depth class: Very deep
Slope range: 2 to 25 percent

Associated Soils

- The moderately well drained Marbie soils, on similar landforms
- Frederick soils, which have a fine particle size; on uplands
- Timberville soils on toeslopes

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Typic Paleudults

Typical Pedon

Wyrick silt loam in an area of Wyrick-Marbie complex, 7 to 15 percent slopes; 560 yards southwest of the intersection of Highways VA 633 and VA 614, about 50 yards northwest of Highway VA 633; Wyndale, Virginia USGS 7.5 Minute Quadrangle, NAD27; lat. 36 degrees 42 minutes 22 seconds N. and long. 82 degrees 5 minutes 27 seconds W.

Ap—0 to 12 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; common fine roots; few fine pores; slightly acid; clear smooth boundary.

Bt1—12 to 25 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; few faint clay films on all faces of peds; few medium distinct light yellowish brown (10YR 6/4) masses of oxidized iron; strongly acid; clear smooth boundary.

2Bt2—25 to 49 inches; yellowish red (5YR 5/8) silty clay; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few fine pores; common faint clay films on all faces of peds; many coarse prominent black (10YR 2/1) iron-manganese masses and brownish yellow (10YR 6/6) masses of oxidized iron; 2 percent gravel; very strongly acid; gradual smooth boundary.

2Bt3—49 to 65 inches; brownish yellow (10YR 6/6) and yellowish red (5YR 5/8) silty clay; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine pores; common faint clay films on all faces of peds; 5 percent gravel; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Depth to lithologic discontinuity: 20 to 60 inches
Rock fragments (kind, content): Chert, shale, siltstone, or fine-grained sandstone; 0 to 15 percent
Reaction: Extremely acid to strongly acid

A horizon (if it occurs):
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—loam, silt loam, or silty clay loam

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—silt loam

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, silt loam, silty clay loam, or clay loam

2Bt horizon:
Hue—5YR to 10YR
Value—4 to 8
Chroma—4 to 8
Texture—silty clay loam, silty clay, or clay

2C horizon (if it occurs):
Hue—5YR to 2.5Y
Value—4 to 8
Chroma—4 to 8
Texture—loam to clay

Formation of the Soils

This section describes the factors and processes that have affected the formation and morphology of the soils in the Washington County Area.

Factors of Soil Formation

Soils are intimate mixtures of broken and partly or completely weathered rock, minerals, organic matter, living plants and animals, water, and air. They occur as part of the natural landscape and differ from place to place. Some of the ways in which they differ are in occurrence and degree of development of various horizons, in mineral content, in depth over rock, and in texture, color, and slope. The characteristics of the soils at any given area depend on the interaction of five soil-forming factors—parent material; climate; plants and animals; relief, or topography; and time.

The soil-forming factors have an influence on the genesis of every soil, but their relative importance varies from place to place. One factor may outweigh others in the formation of a specific soil and may determine most of its properties. For example, a very young floodplain soil may show only faint soil horizonation because of the short time the soil-forming factors have had to work. In contrast, a soil formed in residuum from bedrock on a stable landscape may show distinct horizons because the soil material has remained largely in place and all the soil-forming factors have been active for a long time. In general, however, it is the combined action of the five factors that determine the character of each soil.

Parent Material

The geologic strata, or parent materials, in Washington County are in an orderly pattern and occur in local physiographic areas (fig. 9) *(11, 23)*. The Valley and Ridge physiographic province portion of the survey area contains the local physiographic areas of Mountains, Shale-Limestone Knobs, Limestone Valley, and Shale Knobs. The Blue Ridge physiographic province portion of the survey area contains the local physiographic area of Mountains. The local physiographic area of Mountains consists mainly of sandstone and some shale and siltstone geology in the Valley and Ridge physiographic portion of the survey area and mainly gneiss, schist, granite, graywacke, felsite, rhythmite, rhyolite, and tillite geology in the Blue Ridge physiographic portion. The Shale-Limestone Knobs local physiographic area contains predominantly limestone with interbeds of shale. The Limestone Valley local physiographic area contains predominantly limestone and dolomite. The Shale Knobs local physiographic area contains predominantly shale.

The sedimentary rocks in the survey area belong to the Mississippian, Devonian, Silurian, Ordovician, and Cambrian Systems. These rocks are the parent material of most of the soils in Washington County and occur in the Valley and Ridge physiographic province. Crystalline rocks, which are Pre-Cambrian in age, occur in the extreme southeastern corner of the county in the area of Whitetop Mountain in the Blue Ridge physiographic province.

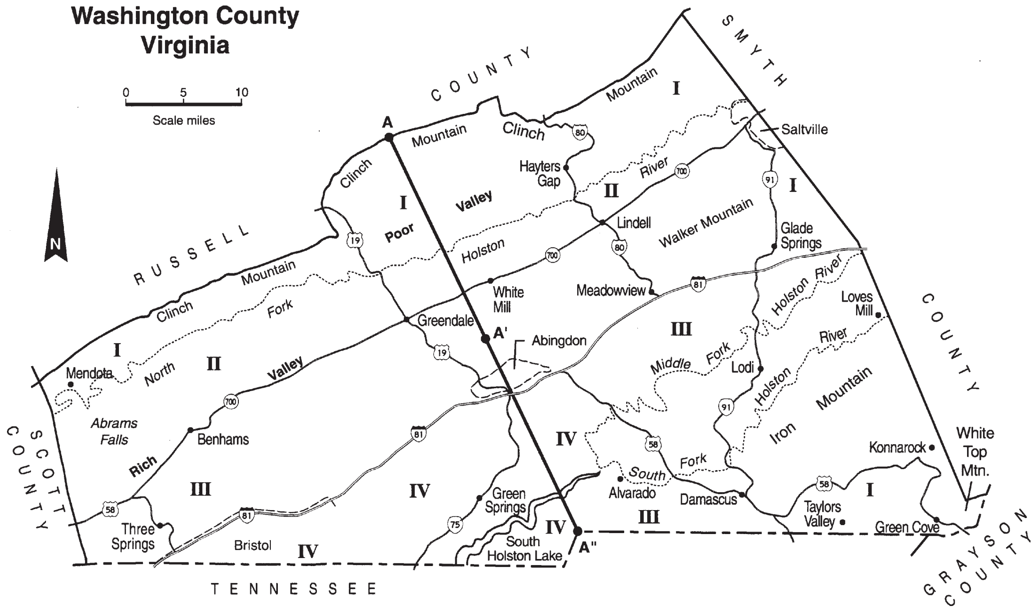


Figure 9.—The local physiographic areas in Washington County: (I) Mountains; (II) Shale-Limestone Knobs; (III) Limestone Valley; and (IV) Shale Knobs.

The two broad classes of parent material in the Washington County Area are residual material and transported material. Residual material, or residuum, accumulated in place by the weathering of the underlying rock. The characteristics of residuum are related directly to those of the underlying rocks. Transported material is colluvium and alluvium. Alluvium was laid down by water, and colluvium was laid down by gravity as unconsolidated deposits of clay, silt, sand, and rock fragments. The characteristics of the transported material are related to those of the soils or rocks from which the material originated.

The characteristics of a soil can be traced directly to its parent material. These characteristics include texture, mineral content, the kind and quantity of clay, natural fertility, soil reaction, and, in some places, color.

The parent materials in each of the local physiographic areas of the county have distinct characteristics that influence the soils in these areas (fig. 9). Figures 10 and 11 show a schematic cross section of the typical geology, or parent material, in Washington County and the major soils that occur on each. Minor soils are not shown. Figure 9 shows the route of this schematic cross-section. Table 22 shows the types of geology in the survey area and the soils that occur on each.

Following are descriptions of the local physiographic areas. The discussion generally follows the sequence of formations as they appear in figures 10 and 11. The geologic information was adapted from “Geology of the Appalachian Valley in Virginia” *(5)*, “Geology of the Abingdon, Wyndale, Holston Valley, and Shady Valley Quadrangles, Virginia” *(3)*, and “Geology of the Bristol and Wallace Quadrangles, Virginia” *(4)*.

Mountains

Rocks of the Clinch Sandstone and Clinton Formation of Silurian age underlie the slopes of Clinch Mountain, which is along the northwestern border of Washington County. Strata in these areas generally dip to the southeast.

The Clinch Sandstone is thick bedded and composed almost entirely of pure quartz sand, is generally light gray to white, and is very hard. The formation is locally

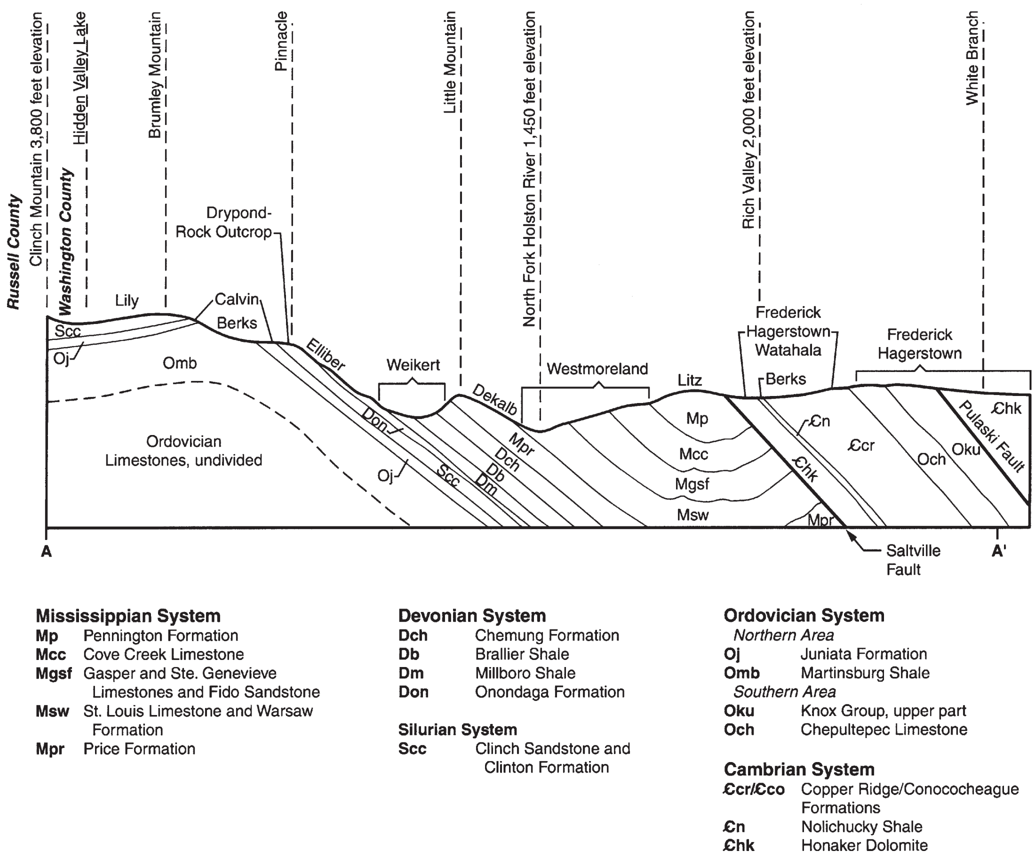
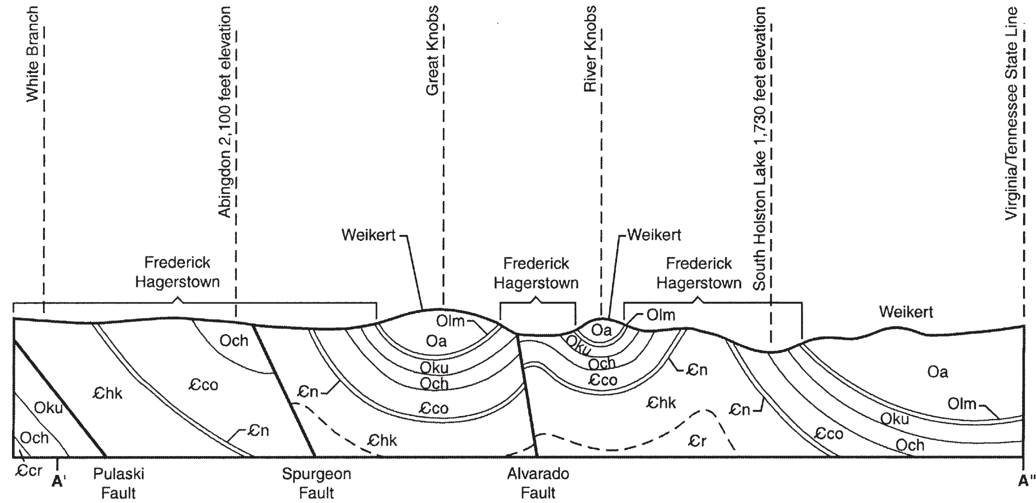


Figure 10.—Schematic cross section of the major geologic strata and dominant soils in Washington County (A-A´). Route of cross section is shown in figure 9.

a friable sandstone, and, in places, disintegrates into pure white sand. The Clinton Formation typically contains light gray to purplish gray, thick-bedded siltstone and sandstone, but light greenish gray and maroon shale may occur in the upper part. The gently sloping to very steep Lily soils are dominant on the ridgetops and side slopes of Clinch Mountain where the Clinch Sandstone and Clinton Formation occur. Calvin, Drypond, and Berks soils occur to a minor extent.

In places along the southern exposures of Clinch Mountain, rocks of the Juniata Formation and the Martinsburg Shale, which are of Ordovician age, and the Onondaga Formation and Brallier Shale, which are of Devonian age, are exposed. These formations exert a significant influence on soil types. The Brallier Shale is commonly the most extensive of these formations and appears in most places along the length of Poor Valley at the base of Clinch and Little Mountains. The Juniata Formation, Martinsburg Shale, and Onondaga Formation are exposed where geologic erosion has created deep-cut drainageways into the southern slopes of Clinch Mountain. The rocks in these areas commonly occur in deep-cut coves, such as Tumbling, Big Horse, Kesner, and Bear Coves. The Pinnacle is a tall outcrop of Clinch Sandstone and is an example of an area where geologic erosion has left a fragment of the Clinch Sandstone uneroded and exposed, similar to an island surrounded by masses of other rock formations (fig. 10). In other areas where this type of erosion has not occurred, the Clinch Sandstone and Clinton Formation are present from the southern base to the top of Clinch Mountain.

The Juniata Formation is one of four reddish rock beds in Washington County. It is



Ordovician System
Oa Athens Formation
Olm Lenoir and Mosheim Limestone
Oku Knox Group, upper part
Och Chepultepec Limestone

Cambrian System
Ꞓcr/Ꞓco Copper Ridge/Conococheague Formations
Ꞓn Nolichucky Shale
Ꞓhk Honaker Dolomite
Ꞓr Rome Formation

Figure 11.—Schematic cross section of the major geologic strata and dominant soils in Washington County (A´-A´´). Route of cross section is shown in figure 9.

composed primarily of bright red shale or mudrock and beds of brown to red sandstone. The distinctive feature is the red color. The reddish soils of the Calvin series are dominant on the Juniata Formation.

The Moccasin Limestone is a second reddish bedrock in the county. It is exposed in the Moccasin Gap area adjacent to U.S. Route 19. It is maroon and mottled maroon to light gray, argillaceous, thin-bedded limestone. Much of the exposed rock is bright red. Bland soils dominantly occur on the Moccasin Limestone.

The Martinsburg Shale is dominantly shale. The unweathered shale is bluish, but on weathering it becomes yellowish to brownish. The main body of the formation is a thin-bedded calcareous mudrock, but layers largely composed of very fine quartz sand and many thin layers of fossiliferous limestone are scattered throughout the mass, from bottom to top. Westmoreland soils are dominant on the Martinsburg Shale.

The Onondaga Formation is nearly all chert on the immediate outcrop in Washington County. More deeply buried parts of the formation are composed of limestone. Much of the chert is exceedingly massive, gnarly, and dense. Elliber soils dominantly occur on landscapes that are underlain by the Onondaga Formation. These soils are most recognizable by the presence of chert fragments on the soil surface and outcroppings of limestone or chert bedrock.

The Brallier Shale is a mass of subfissile, stiff, more or less sandy and micaceous green shale. In localized areas of the county, black shale beds occur in the lower half of the formation. The Brallier Shale extends the length of Washington County and is the dominant rock type underlying Poor Valley. Shale knobs with steep and very steep slopes are a common landscape in Poor Valley. Weikert soils are dominant on the Brallier Shale. These soils are thin. Small inclusions of deeper soils may also occur. In areas where the Brailler Shale is massively eroded, colluvial landscapes occur. Ernest soils formed from the material in the gently sloping or sloping colluvial positions. Hayter soils are common and occur on similar landscapes or in steeper areas.

Tumbling and Macove soils formed from colluvial material at the southern base of Clinch Mountain and at the northern base of Little Mountain. These soils exhibit properties that reflect the rock types of these mountains. For example, in the Brumley Gap area, large boulders that have been broken from the Clinch Sandstone and moved downslope by gravity are common on the soil surface of Tumbling soils. Some reddish colors within Tumbling soils reflect the nature of the red Juniata Formation.

The soil material on the bottom lands of Poor Valley, such as those near the East and West Forks of Wolf Creek, is somewhat mixed. Soils in this area are relatively young and show limited soil development.

The ridge of Little Mountain runs the length of Washington County in a northeast to southwest direction. Little Mountain becomes progressively narrower towards the western boundary of the county. Generally, Little Mountain lies between Poor Valley and the North Fork of the Holston River, except in two areas where the meandering of the river has cut through the mountain and flows through Poor Valley for a short distance. These two areas are just west of U.S. Route 19 where large river terraces exist at the base of Clinch Mountain and farther westward near Mendota. Because rocks underlying Little Mountain dip in a southern direction, the northern outcrop side of the mountain exhibits the steepest slopes of the mountain.

Rocks of the Chemung Formation of Devonian age underlie the northern slopes of Little Mountain, mostly on the middle and lower parts. This formation is a thick body of shale and some sandstone. The sandstone is generally medium grained. It is mainly gray to greenish and, to a minor degree, reddish and blackish. Most of the shale in the Chemung Formation is green, soft, and poorly fissile as compared with that of the Brallier Shale. Weikert soils formed over the Chemung Formation.

Rocks of the Price Formation of Mississippian age underlie the southern exposures of Little Mountain and the upper part of the northern exposure. This formation is gray, medium-bedded sandstone and siltstone. It is conglomeratic at the top and dominantly gray silty shale in the lower part. Rocky, relatively shallow, and weakly developed Dekalb and Drypond soils developed in material weathered from the Price Formation.

The Walker Mountain chain runs south of Saltville and extends into the Washington County Area 8 miles northeast of Abingdon near State Highway 80, about 2 miles north of Meadow View (fig. 9). The geology and soils of Walker Mountain closely resemble those of Clinch Mountain, except that the Clinch and Clinton sandstones give way to the more prevalent Martinsburg Shale. The northern slopes of Walker Mountain contain bands of the reddish Moccasin Limestone and other grayish to bluish limestones. Gray to black shale of the Athens Formation occurs at the northern base of Walker Mountain. Weikert soils formed in the material weathered from the Athens Shale, which is similar to the Brallier Shale.

Locally, Walker Mountain extends the length of Washington County, crossing into Scott County just south of U.S. Route 58. However, southwest of State Highway 80, the topography of Walker Mountain becomes less mountainous and appears more like the landscapes of the Limestone Valley. Although ridges prevail, the geology and soils are of a limestone nature and not of a mountainous nature. Rocks of the Knox Dolomite are common to these ridges. Frederick soils formed in these materials. Some areas commonly contain a high content of chert and sandstone fragments. Rock outcrops of hard limestone are also common.

The mountainous area in the southeastern corner of Washington County contains rocks of both sedimentary and igneous origins. The most dominant outcrop of the Rome Formation, of Cambrian age, occurs along the length of Wideners Valley at the northern base of Iron Mountain. The sedimentary rocks of the Rome Formation are interbedded gray-brown, gray-green, and maroon silty shale; maroon and yellow calcareous siltstone; and light gray, argillaceous, calcareous dolomite. The variability of rocks in this formation has resulted in soils that vary in depth, color, and texture within short distances. The soils are shallow to deep and commonly occur in a banded or mixed pattern. Sedimentary rocks of Iron Mountain are dominantly sandstone with small inclusions of shale. Lily soils formed in material weathered from these rocks.

The igneous rocks of the Whitetop Mountain area are crystalline in nature and are of Pre-Cambrian age. These rocks occur from the summit of Whitetop Mountain to the base of the mountain near Konnarock. Gneiss, schist, granite, graywacke, felsite, rhythmite, rhyolite, and tillite rocks are common in this area. Konnarock, Pigeonroost, and Edneytown soils are common on these rocks. Tate and Greenlee soils occur on footslopes in this area.

The parent rocks of Clinch, Little, Walker, Iron, and Whitetop Mountains are more resistant to weathering than any other rocks in the county. They generally produce soils that are rocky and shallow.

Tumbling soils dominantly occur on the colluvial landscapes at the southern base of Little Mountain, although soils of the Macove series are also common.

Floodplains along the North Fork of the Holston River generally consist of stratified alluvial sediments of recent origin. These sediments are commonly dark in color and coarse grained, but fine-grained particles are common. Flooding along the river prevents any mature development of the soils on these floodplains. Wolfgap and Sindion soils formed in these sediments.

Ingledove and Botetourt soils occur on the low river terraces of the North Fork of the Holston River. These terraces, or old alluvial deposits, were previously the floodplains before the river bed was cut to its present-day position. Because only rare flooding occurs on these landscapes, soil-forming processes have had time to produce significant soil development.

Shale-Limestone Knobs

The Shale-Limestone Knobs lie between the North Fork of the Holston River and Rich Valley (fig. 9). The dominant rocks are the Cove Creek, Gasper, and Ste. Genevieve Limestones of Mississippian age. The rocks are gray to light gray, thinly bedded to medium-bedded, argillaceous limestones that become shaly when weathered. Westmoreland soils are dominant on these limestones. Abrams Falls and Caney Valley are within the Shale-Limestone Knobs.

The Pennington Formation is a separate geologic strata within the Shale-Limestone Knobs. This formation lies on the southern edge of the knobs. It begins as a narrow strip just northeast of Whites Mill and expands southwestward along the northern edge of Rich Valley, with its northern boundary nearing McCalls Gap on the western edge of Washington County. The Pennington Formation is almost wholly composed of maroon and greenish gray, interbedded shale and sandstone but contains a few thin beds of impure limestone. Rocks of this formation weather to produce soils that may vary in color and depth within short distances. Litz soils are dominant on these rocks. The Fido Sandstone is a thin component of these knobs and is a reddish sandstone.

Limestone Valley

The Conococheague, Copper Ridge, and Honaker Formations of Cambrian age and the Chepultepec Limestone and Knox Group of Ordovician age form most of the underlying rocks in the broad, rolling Limestone Valley of the Washington County Area (figs. 9, 10, and 11). A narrow strip of the Nolichucky Shale is exposed in a few places. One example is on the northern edge of the valley, just south of Rich Valley.

The Conococheague Formation is about 75 percent thick-bedded blue limestone.

Most of the remainder is dolomite. Thin veins of coarse-grained sandstone are notable along with a very small amount of black chert.

The Copper Ridge Formation is mostly thick-bedded, medium coarse-grained, bluish gray dolomite. Small veins of sandstone also occur, and chert is extremely abundant in places.

The Honaker Formation is almost entirely thick-bedded, dark bluish gray, argillaceous dolomite that weathers to coarse-grained, lumpy, mealy, ferruginous clay. Generally, chert is relatively rare in the Honaker Formation.

The Chepultepec Limestone is dominantly nearly pure limestone that is commonly thick bedded, blue, and finely crystalline. It characteristically contains more than 90 percent calcium carbonate.

The Knox Group is light gray, fine- to coarse-grained, cherty dolomite that has minor beds of blue-gray limestone.

The soils in the Limestone Valley have developed mostly in material weathered in place. These residual soils reflect certain properties of the different limestones and dolomites. The rocks are relatively easily weathered and have produced soils that are typically very deep, are moderately to strongly developed, have a high content of clay, and vary in content of rock fragments. Upon weathering, the soluble minerals of the limestones are readily leached; therefore, the soils are low in natural fertility.

Frederick soils containing little or no chert are the dominant soils that formed from these limestone and dolomite rocks. In areas, such as those underlain by the Knox cherty dolomite or the Copper Ridge Formation, Frederick soils containing a considerable amount of chert fragments and Watahala soils occur. Certain pronounced ridges in the county contain notable sandstone fragments along with few chert fragments. The materials on these ridges are described as Frederick soils but they contain more sand and less clay than is typical for the Frederick series. Two such ridges are Chestnut Ridge near Rhea Valley and the area locally known as Walker Mountain near the Scott County border.

Outcrops of limestone are common throughout the Limestone Valley, especially on the steeper slopes, and the total acreage of rocky soils is fairly large.

Colluvial material in the Limestone Valley is of moderate extent. Wyrick and Marbie soils formed in colluvial material at the base of slopes. Timberville soils formed in material that has been washed from nearby uplands into intermittent drainageways and to the bottom of sinkholes.

Soils in the bottom lands along small streams and creeks, such as White Branch and Sinking Creek, formed in material that has been washed from nearby and distant uplands. These soils are somewhat mixed, weakly developed, commonly medium textured, and high in natural fertility. Areas of these soils are generally small in acreage.

Floodplains along the Middle and South Forks of the Holston River generally consist of stratified alluvial sediments of recent origin that have traveled either long or short distances. The sediments are typically dark in color and coarse grained, but fine-grained particles are common. Flooding along the rivers prevents any mature development of the soils on these floodplains. Speedwell and Sindion soils dominantly formed in these sediments.

Wheeling soils occur on the low river terraces of the Middle and South Forks of the Holston River. These terraces, or old alluvial deposits, were previously the floodplains before the river bed was cut to its present-day position. Because only rare flooding occurs on these river terraces, the soil-forming processes have had time to produce significant soil development.

The Nolichucky Shale, of Cambrian age, is exposed on the northern edge of the Limestone Valley and extends the length of Washington County, running parallel to Rich Valley. The Nolichucky Shale is composed of alternating beds of shale and limestone which vary in relative amount and proportion in different areas but which are dominantly shale. The shale is commonly grayish, greenish, yellowish, or drab and is soft and fissile. The limestone is generally thin bedded or moderately thick bedded and is commonly banded with clayey impurities. Locally, rocks of the Nolichucky Shale weather unevenly, and the soils that form on them vary in color and depth within short distances.

Shale Knobs

Rocks of the Athens Formation, of Ordovician age, underlie the slopes of the Shale Knobs in Washington County. These Shale Knobs lie within the Limestone Valley and come into view as a sequence of intermittent ridges that are spaced from $^{1}/_{2}$ mile to 2 miles apart and run in a northeast to southwest direction (fig. 9). The largest of these knobs are the Great Knobs, which originate near Cedarville and extend southwestward for 18 miles to the Tennessee State line, just 3 miles east of Bristol. The Athens Formation is dominantly gray to black, fissile shale that has a minor component of thinly bedded limestone. Weikert soils formed in material weathered from this shaly formation.

The synclinal nature of the Athens Formation lends to the outcrop of the Lenoir and Mosheim Limestones at the base of the knobs. Although these outcrops do not always occur, they are very common.

Climate

Climate affects the physical, chemical, and biological relationships in soils, principally through the influence of precipitation and temperature. Water dissolves minerals, supports biological activity, and transports minerals and organic residues through the soil. Temperature determines the type and rate of physical, chemical, and biological activities occurring in the soil. Weathering is more rapid in a warm, humid climate than in a cold or dry climate.

Because precipitation in Washington County exceeds evapotranspiration, the soils have been intensively leached. Most of the soluble materials that originally were present or were released through weathering have been removed, except in alluvial areas, which are recharged with eroded sediments from surrounding uplands. Although the bedrock in some areas contains calcium, free carbonates of lime have not accumulated in the soils because of leaching. Most of the soils in the survey area are acidic in nature.

Precipitation is the main factor in the formation of the subsoil that characterizes most of the soils in the survey area. In addition to leaching soluble materials, water that percolates through the soil moved clay from the surface layer to the subsoil. Except for soils that formed in recent alluvium or sand or on very steep slopes, all the soils in the county typically have a subsoil that is more clayey than the surface layer.

The formation of blocky structure in the subsoil of well developed soils, such as Frederick soils, is also influenced by climate. The development of peds (aggregates) in the subsoil is primarily caused by changes in volume of the soil mass resulting from alternating periods of wetting and drying.

Climate varies locally due to the differences in the degree and direction of slope and elevation. Generally, soils on steep uplands facing a southern direction are drier than soils on similar landscapes facing north. Soils forming in these different areas may vary, even if the parent materials are the same. At the higher elevations in mountainous areas, particularly on Whitetop Mountain, the climate is cooler, the precipitation, particularly snowfall, is greater, and fogs are more common. In these higher, cooler areas, soils may be a little darker and may contain a little more organic matter than soils at lower elevations. Weathering of parent materials is slower, and the soils generally are thinner than the soils at lower elevations.

Plants and Animals

Biologic forces are important in the formation of soil in the Washington County Area. Trees, shrubs, grasses, and other herbaceous plants, as well as microorganisms, earthworms, and other plant and animal life, are active agents in the soil-forming process. The kinds of plants and animals that live on and in the soil are determined by climate, parent material, relief, age of the soil, and other environmental factors. Where climate or vegetation varies significantly, the soils vary accordingly.

Plants supply organic matter and transfer moisture and plant nutrients from the lower horizons to the upper horizons. Organic matter decomposes and is mixed into the soil by microorganisms and earthworms or by chemical reactions. In the survey area, the rate of decomposition is rapid because of favorable temperatures, abundant soil moisture, and microorganisms in the soil. Organic matter content in the soil is typically moderate or low and ranges from 1 to 3 percent, by volume, in the surface layer.

Originally, the vegetation in the survey area was a dense forest of hardwoods or mixed hardwoods and pine. The density of the stands, the proportion of different species, and the kinds of ground cover varied to some extent. Leaves of deep-rooted deciduous trees vary in content of plant nutrients but generally return more bases and phosphorus to the soils than coniferous trees.

As agriculture developed in the Washington County Area, human activities, such as the clearing of forests and the introduction of new kinds of plants, influenced soil formation. Cultivation and artificial drainage, as well as applications of lime and fertilizer, changed some characteristics of the soils. Human activities have accelerated erosion. Because of this erosion, the soil in many areas is thinner and vegetation is difficult to establish. Some soil material has been washed from sloping areas down to depressionsand floodplains. Young, or immature, soils, such as Timberville, formed in this washed material.

Topography

Topography, or lay of the land, affects the formation of soils by causing differences in internal drainage, surface runoff, soil temperature, and geologic erosion. Topography also affects the amount of radiant energy absorbed by the soils, which affects native vegetation. Topography alters the effect of parent material on soil formation; thus, several different soils can form from the same parent material.

Slopes in Washington County range from nearly level to very steep. In the steeper areas, runoff is rapid and only a small amount of water percolates through the soil. Consequently, the translocation of clay and bases is reduced. Soil material erodes as rapidly as it forms. Aspect varies greatly in these areas, affecting vegetation and soil formation. South-facing slopes are drier than north-facing slopes. Weikert, Dekalb, and Litz soils formed in the steeper areas.

In gently sloping and strongly sloping areas, soils are generally well drained and slightly eroded. The soils in such areas are mature, having well defined horizons. Frederick and Hagerstown soils are examples. Low-lying, flat areas, or depressions, are wetter and often ponded. Drainage in these areas is restricted. Soils on colluvial slopes or within drainageways often receive runoff from nearby uplands, and lateral underground seepage from the higher areas is common. Soils may be influenced by carbonates or other bases carried in the ground water. Soils are better drained on convex slopes. Water from runoff and internal drainage accumulates on concave slopes. Tumbling and Wyrick soils are examples of well drained soils on colluvial slopes, and Marbie and Ernest soils are examples of moderately well drained soils.

Time

The length of time that climate, vegetation, and topography have acted on parent material affects the character of the soil. An old, strongly developed soil shows well defined genetic horizons. A young, less developed soil shows only faint or weakly developed horizons. The soils in the survey area range from young soils on bottom lands to old soils on smooth uplands.

Periodic flooding keeps alluvial soils in a state of change. Consequently, most soils on floodplains are weakly developed. Some of the alluvial soils in Washington County, such as Clubcaf, Sindion, Speedwell, and Wolfgap, have not been in place long enough to form genetic horizons.

In steep and very steep areas, soil material is either moved by creep and washing or mixed by solifluction before there has been sufficient time for a deep soil profile to develop. As a result, shallow and weakly developed soils, such as Dekalb, Drypond, and Weikert, are common on steep slopes.

In smooth upland areas, soil material is relatively stable and its removal by erosion is slow. Therefore, the soil-forming factors have had a long time to act on the same material. Mature soils that have distinct genetic horizons, such as Frederick soils, formed in these areas.

Morphology of the Soils

The interaction of soil-forming factors results in distinguishable layers, or horizons, in a soil profile. The soil profile extends from the surface of the soil down to materials that are little altered by the soil-forming processes.

Most soils have three major horizons—the A, B, and C horizons. Some soils have a fourth major horizon, an E horizon, between the A and B horizons. These major horizons can be further subdivided by using letters and numbers to indicate changes within a horizon. A Bt2 horizon, for example, represents a layer within the B horizon consisting of translocated clay eluviated from the A and E horizons.

The A horizon, or surface layer, has the largest accumulation of organic matter.

The E horizon is the layer of maximum leaching, or eluviation, of clay and iron.

The B horizon, or subsoil, is beneath the A or E horizon. It is the horizon of maximum accumulation, or illuviation, of clay, iron, aluminum, and other elements leached from the layers above. In some soils, the B horizon is formed by alteration in place rather than by illuviation. The alteration may be caused by the oxidation and reduction of iron or by the weathering of clay minerals. The Bt horizon is a layer of accumulated clay. Generally, it is firmer, has a finer texture, has a stronger structure, and is brighter or redder than the A horizon. Most young soils do not have developed Bt horizons.

The C horizon is below the A and B horizons. It consists of material that has been little altered by the soil-forming processes but may have been modified by weathering.

Processes of Horizon Differentiation

Soils formed as the result of the physical weathering of parent rocks, the chemical weathering of rock fragments and organic matter, the transfer of materials, and the gains and losses of organic matter and minerals.

Soil formation begins with the physical weathering of rocks. Large pieces of rock are broken into smaller pieces by frost action, expansion, contraction, and other forces. The rocks and rock fragments are further reduced to sand-, silt-, and clay-sized particles. These particles form the unconsolidated material in which plants can grow. Organic material is added to the soil when plants and animals die.

Soil constituents are transfered from one part of the soil to another. Organic matter in suspension moves from the surface layer to the subsoil. Calcium and other elements are leached from the surface layer. These elements are typically held by the clay in the subsoil or the substratum, but some are leached from the soil by percolating water.

Bases are absorbed by the roots of plants and stored in stems, leaves, and twigs. When plants die and decay, the elements absorbed by the plants are returned to the soil. In most soils in the Washington County Area, the translocation and development in place of clay minerals have had a strong influence on the development of soil horizons. As the soil develops, horizons gradually develop recognizable characteristics that make one horizon distinguishable from another.

The accumulation and incorporation of organic matter take place as the plant residue decomposes. Organic matter darkens the surface layer and helps form the A horizon. In many places the surface layer has been eroded away or has been mixed with materials from underlying layers through cultivation. Once lost, organic matter takes a long time to replace. In the survey area, the organic matter content of the surface layer ranges from low, as in Frederick and Weikert soils, to moderate, as in Sindion soils.

For soils to have distinct subsoil horizons, some of the lime and soluble salts must be leached before the translocation of clay minerals can take place. Among the factors that effect this leaching are the salts originally present, the depth to which the soil solution percolates, and the texture of the soil profile.

Well drained and moderately well drained soils in Washington County have a yellowish brown or yellowish red subsoil. These colors are caused mainly by thin coatings of iron oxides on the soil particles, although in some soils the color is inherited from the materials in which they formed. The structure of the subsoil is commonly weak to moderate subangular blocky. The subsoil contains more clay than the overlying surface horizon.

The reduction and transfer of iron, called gleying, is associated mainly with the wetter, more poorly drained soils. Moderately well drained soils generally have yellowish brown and strong brown redoximorphic features that indicate the segregation of iron. In poorly drained soils, the subsoil and underlying material are grayish, which indicates reduction and transfer of iron by removal in solution.

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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.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

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

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

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

Aspect. The direction in which a slope faces.

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

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

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

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

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

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

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.

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

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

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

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

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.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

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 depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

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 plant community. 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 textured soil. Sand or loamy sand.

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

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

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

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse-grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

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

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

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

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

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

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

Cropping system. Growing crops according to a planned system of rotation and management practices.

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

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

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

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

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

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

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

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

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

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.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of 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 floodplains and coastal plains. Synonym: natural erosion.

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

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

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

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

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*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

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

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

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

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

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

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

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

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

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

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.

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.

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 as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

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

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

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

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

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

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.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

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

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

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

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

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

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

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

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

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

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

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

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

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

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

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

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

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.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

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.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

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

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

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

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.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

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

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

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

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

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

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

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

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

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

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

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 movement of water through the soil.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

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

Impermeable	less than 0.0.015 inch
Very slow	0.0.015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

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

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

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

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

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.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse-grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

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.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

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

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

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

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

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 ranging 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.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturated hydraulic conductivity (K_{sat}). The amount of water that would move vertically through a unit area of saturated soil in unit time under unit hydraulic gradient. Terms describing saturated hydraulic conductivity, measured in inches per hour, are as follows:

Very low	0.00 to 0.001417
Low	0.001417 to 0.01417
Moderately low	0.01417 to 0.1417
Moderately high	0.1417 to 1.417
High	1.417 to 14.7
Very high	more than 14.7

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal floodplain (or first bottom) of a river.

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.

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

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

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

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

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

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

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

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.

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

Sinkhole. A depression in the landscape where limestone has been dissolved.

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.

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. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 or 3 percent
Gently sloping	2 to 7 percent
Strongly sloping	7 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 50 percent
Very steep	50 percent and higher

Classes for complex slopes are as follows:

Nearly level	0 to 2 or 3 percent
Undulating	2 to 7 percent
Rolling	7 to 15 percent
Hilly	15 to 25 percent
Steep	25 to 50 percent
Very steep	50 percent and higher

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

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

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

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

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

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

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 that provide vegetative barriers to wind erosion and water erosion.

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

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

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

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

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

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

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

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

Terrace (geomorphology). 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.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

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

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

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

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

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.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.—Temperature and Precipitation

(Recorded in the period 1971-2000 at Abingdon, Virginia)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temp. higher than--	2 years in 10 will have-- Minimum temp. 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 snow-fall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January--	44.6	23.8	34.2	69	-7	59	4.08	2.83	5.23	9	6.8
February-	49.4	26.0	37.7	74	-1	86	3.89	2.53	5.12	8	4.8
March----	59.0	32.9	45.9	80	8	235	4.51	2.87	5.99	9	1.8
April----	67.8	39.7	53.8	86	21	422	3.71	2.27	5.00	8	0.2
May------	75.4	48.3	61.8	88	30	672	4.89	3.26	6.37	9	0.0
June-----	82.0	56.5	69.3	92	39	876	4.17	2.41	5.73	8	0.0
July-----	85.4	60.5	73.0	94	48	1,020	4.76	3.23	6.17	9	0.0
August---	84.3	59.2	71.7	94	46	981	3.71	2.50	4.82	7	0.0
September	78.7	52.8	65.7	91	34	771	3.55	1.59	5.22	6	0.0
October--	68.9	40.8	54.8	83	22	461	2.79	1.30	4.07	5	0.0
November-	58.1	33.4	45.8	79	14	223	3.35	2.14	4.45	7	0.5
December-	48.4	26.4	37.4	71	1	95	4.01	2.52	5.35	8	2.2
Yearly:											
Average	66.8	41.7	54.3	---	---	---	---	---	---	---	---
Extreme	100	-21	---	95	-10	---	---	---	---	---	---
Total--	---	---	---	---	---	5,902	47.41	41.75	52.25	93	16.2

* 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 1971-2000 at Abingdon, Virginia)

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. 16	May 1	May 16
2 years in 10 later than--	Apr. 10	Apr. 25	May 10
5 years in 10 later than--	Mar. 30	Apr. 15	Apr. 29
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 17	Oct. 4	Sept. 29
2 years in 10 earlier than--	Oct. 24	Oct. 10	Oct. 3
5 years in 10 earlier than-	Nov. 5	Oct. 20	Oct. 10

Table 3.—Growing Season

(Recorded in the period 1971-2000 at Abingdon, Virginia)

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	194	165	140
8 years in 10	203	173	148
5 years in 10	220	188	163
2 years in 10	236	204	178
1 year in 10	245	212	185

Table 4.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1B	Allegheny loam, 2 to 7 percent slopes	307	*
1C	Allegheny loam, 7 to 15 percent slopes	505	0.1
2A	Atkins loam, 0 to 3 percent slopes, frequently flooded	430	0.1
3D	Berks silt loam, 7 to 25 percent slopes	350	0.1
3E	Berks silt loam, 25 to 50 percent slopes	2,636	0.8
3F	Berks silt loam, 50 to 80 percent slopes	2,394	0.7
4D	Bland silty clay loam, 15 to 25 percent slopes, rocky	43	*
4E	Bland silty clay loam, 25 to 50 percent slopes, rocky	96	*
5B	Botetourt loam, 2 to 7 percent slopes, rarely flooded	811	0.2
6D	Calvin silt loam, 7 to 25 percent slopes	304	*
6E	Calvin silt loam, 25 to 50 percent slopes	960	0.3
6F	Calvin silt loam, 50 to 65 percent slopes	3,169	0.9
7A	Clubcaf silt loam, 0 to 3 percent slopes, frequently flooded	2,227	0.6
8D	Dekalb channery loam, 15 to 25 percent slopes	287	*
8E	Dekalb channery loam, 25 to 60 percent slopes	7,230	2.1
9F	Drypond-Rock outcrop complex, 25 to 80 percent slopes	4,013	1.1
10F	Drypond channery loam, 50 to 80 percent slopes	2,863	0.8
11B	Ebbing loam, 2 to 7 percent slopes, rarely flooded	797	0.2
12C	Edneytown loam, 7 to 15 percent slopes	12	*
12D	Edneytown loam, 15 to 25 percent slopes	27	*
12E	Edneytown loam, 25 to 35 percent slopes	8	*
13C	Elliber very gravelly silt loam, 7 to 15 percent slopes	406	0.1
13D	Elliber very gravelly silt loam, 15 to 25 percent slopes	577	0.2
13E	Elliber very gravelly silt loam, 25 to 65 percent slopes	1,891	0.5
14B	Ernest silt loam, 2 to 7 percent slopes	274	*
14C	Ernest silt loam, 7 to 15 percent slopes	1,033	0.3
15C	Faywood silt loam, 7 to 15 percent slopes	124	*
15D	Faywood silt loam, 15 to 25 percent slopes	282	*
15E	Faywood silt loam, 25 to 60 percent slopes	610	0.2
16B	Frederick silt loam, 2 to 7 percent slopes	1,227	0.4
16C	Frederick silt loam, 7 to 15 percent slopes	32,736	9.4
16D	Frederick silt loam, 15 to 25 percent slopes	33,214	9.5
16E	Frederick silt loam, 25 to 45 percent slopes	4,448	1.3
17C	Frederick very gravelly silt loam, 7 to 15 percent slopes	5,666	1.6
17D	Frederick very gravelly silt loam, 15 to 25 percent slopes	9,585	2.7
17E	Frederick very gravelly silt loam, 25 to 45 percent slopes	7,516	2.2
18D	Greenlee very cobbly loam, 7 to 35 percent slopes, very stony	3	*
19C	Hagerstown-Rock outcrop complex, 2 to 15 percent slopes	932	0.3
19E	Hagerstown-Rock outcrop complex, 15 to 45 percent slopes	7,086	2.0
20C	Hagerstown silt loam, 7 to 15 percent slopes, very rocky	3,078	0.9
20D	Hagerstown silt loam, 15 to 25 percent slopes, very rocky	12,551	3.6
20E	Hagerstown silt loam, 25 to 45 percent slopes, very rocky	5,309	1.5
21D	Hagerstown-Rock outcrop complex, karst, 7 to 45 percent slopes	675	0.2
22C	Hagerstown silt loam, karst, 7 to 15 percent slopes, very rocky	9	*
22D	Hagerstown silt loam, karst, 15 to 25 percent slopes, very rocky	2,013	0.6
23C	Hayter loam, 7 to 15 percent slopes	941	0.3
23D	Hayter loam, 15 to 25 percent slopes	299	*
24B	Ingledove loam, 2 to 7 percent slopes, rarely flooded	644	0.2
25C	Konnarock channery silt loam, 7 to 15 percent slopes	163	*
25D	Konnarock channery silt loam, 15 to 25 percent slopes	447	0.1
25E	Konnarock channery silt loam, 25 to 70 percent slopes	1,203	0.3
26B	Lily loam, 2 to 7 percent slopes, very stony	220	*
26C	Lily loam, 7 to 15 percent slopes, very stony	731	0.2
26D	Lily loam, 15 to 25 percent slopes, very stony	1,760	0.5
26E	Lily loam, 25 to 65 percent slopes, very stony	20,161	5.8
27D	Litz silt loam, 15 to 25 percent slopes	1,921	0.6
27E	Litz silt loam, 25 to 50 percent slopes	7,303	2.1
27F	Litz silt loam, 50 to 80 percent slopes, very rocky	6,621	1.9
28C	Litz-Groseclose complex, 7 to 15 percent slopes	246	*
28D	Litz-Groseclose complex, 15 to 25 percent slopes	760	0.2

See footnote at end of table.

Table 4.—Acreage and Proportionate Extent of the Soils—Continued

Map symbol	Soil name	Acres	Percent
28E	Litz-Groseclose complex, 25 to 75 percent slopes	2,652	0.8
29A	Lobdell loam, 0 to 3 percent slopes, occasionally flooded	722	0.2
30C	Macove cobbly silt loam, 7 to 15 percent slopes, rubbly	1,183	0.3
30D	Macove cobbly silt loam, 15 to 25 percent slopes, rubbly	1,078	0.3
30E	Macove cobbly silt loam, 25 to 50 percent slopes, rubbly	1,660	0.5
31C	Macove very channery silt loam, 7 to 15 percent slopes	1,019	0.3
31D	Macove very channery silt loam, 15 to 25 percent slopes	763	0.2
31E	Macove very channery silt loam, 25 to 50 percent slopes	764	0.2
32A	Maurertown silt loam, 0 to 2 percent slopes, rarely flooded	320	*
33A	Mongle loam, 0 to 3 percent slopes, rarely flooded	627	0.2
34B	Monongahela silt loam, 2 to 7 percent slopes	192	*
34C	Monongahela silt loam, 7 to 15 percent slopes	365	0.1
35C	Pigeonroost loam, 7 to 15 percent slopes	16	*
35D	Pigeonroost loam, 15 to 25 percent slopes	207	*
35E	Pigeonroost loam, 25 to 80 percent slopes	1,086	0.3
36F	Rock outcrop-Opequon complex, 50 to 80 percent slopes	445	0.1
37B	Shottower loam, 2 to 7 percent slopes	208	*
37C	Shottower loam, 7 to 15 percent slopes	1,718	0.5
37D	Shottower loam, 15 to 25 percent slopes	771	0.2
38A	Sindion silt loam, 0 to 3 percent slopes, occasionally flooded	3,456	1.0
39A	Speedwell loam, 0 to 3 percent slopes, occasionally flooded	588	0.2
40B	Tate loam, 2 to 7 percent slopes	33	*
40C	Tate loam, 7 to 15 percent slopes	406	0.1
40D	Tate loam, 15 to 25 percent slopes	220	*
41B	Timberville-Marbie complex, 2 to 7 percent slopes, frequently flooded	2,965	0.8
42C	Timberville-Marbie complex, 7 to 15 percent slopes, rarely flooded	9,933	2.8
43B	Tumbling loam, 2 to 7 percent slopes, very bouldery	310	*
43C	Tumbling loam, 7 to 15 percent slopes, very bouldery	718	0.2
43D	Tumbling loam, 15 to 25 percent slopes, very bouldery	172	*
44B	Tumbling loam, 2 to 7 percent slopes	409	0.1
44C	Tumbling loam, 7 to 15 percent slopes	3,417	1.0
44D	Tumbling loam, 15 to 25 percent slopes	2,066	0.6
44E	Tumbling loam, 25 to 45 percent slopes	1,623	0.5
45	Udorthents, 0 to 25 percent slopes	2,051	0.6
46	Udorthents, dams	12	*
47	Udorthents-Urban land complex, 0 to 25 percent slopes	6,112	1.8
48	Urban land	1,825	0.5
49C	Watahala very gravelly loam, 7 to 15 percent slopes	104	*
49D	Watahala very gravelly loam, 15 to 25 percent slopes	250	*
49E	Watahala very gravelly loam, 25 to 45 percent slopes	621	0.2
50D	Weikert silt loam, 15 to 25 percent slopes	3,533	1.0
50E	Weikert silt loam, 25 to 50 percent slopes	22,175	6.4
50F	Weikert silt loam, 50 to 80 percent slopes	5,602	1.6
51C	Westmoreland silt loam, 7 to 15 percent slopes, rocky	542	0.2
51D	Westmoreland silt loam, 15 to 25 percent slopes, rocky	5,025	1.4
51E	Westmoreland silt loam, 25 to 50 percent slopes, rocky	24,135	6.9
51F	Westmoreland silt loam, 50 to 70 percent slopes, rocky	3,132	0.9
52D	Westmoreland-Rock outcrop complex, 7 to 25 percent slopes	342	*
52E	Westmoreland-Rock outcrop complex, 25 to 50 percent slopes	4,222	1.2
52F	Westmoreland-Rock outcrop complex, 50 to 80 percent slopes	2,047	0.6
53B	Wheeling loam, 2 to 7 percent slopes, rarely flooded	767	0.2
54A	Wolfgap fine sandy loam, 0 to 3 percent slopes, occasionally flooded	652	0.2
55B	Wyrick-Marbie complex, 2 to 7 percent slopes	1,605	0.5
55C	Wyrick-Marbie complex, 7 to 15 percent slopes	14,378	4.1
55D	Wyrick-Marbie complex, 15 to 25 percent slopes	423	0.1
W	Water	3,199	0.9
	Total	349,000	100.0

* Less than 0.1 percent.

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture

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

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
1B:							
Allegheny	2e	L	6.0	130	4.0	7.5	2400
1C:							
Allegheny	3e	L	5.0	115	3.5	7.0	2200
2A:							
Atkins	6w	NN	---	---	---	3.5	---
3D:							
Berks	4e	JJ	---	50	2.5	3.5	1200
3E, 3F:							
Berks	7e	JJ	---	---	---	---	---
4D:							
Bland	4e	Y	---	70	2.5	4.5	1800
4E:							
Bland	7e	Y	---	---	---	---	---
5B:							
Botetourt	2e	G	---	140	4.5	8.5	2800
6D:							
Calvin	4e	JJ	---	50	2.5	3.5	1200
6E, 6F:							
Calvin	7e	JJ	---	---	---	---	---
7A:							
Clubcaf	6w	NN	---	---	---	3.5	---
8D:							
Dekalb	4e	FF	---	55	2.5	3.5	1100
8E:							
Dekalb	7e	FF	---	---	---	---	---
9F:							
Drypond	7s	JJ	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---
10F:							
Drypond	7e	JJ	---	---	---	---	---
11B:							
Ebbing	2e	G	---	140	4.5	8.5	2800
12C:							
Edneytown	3e	L	5.0	115	3.5	6.5	2200

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
12D:							
Edneytown---------	4e	L	4.5	105	3.0	6.0	2000
12E:							
Edneytown---------	6e	L	---	---	---	5.5	---
13C:							
Elliber-----------	4s	M	4.0	85	2.5	6.0	1800
13D:							
Elliber-----------	6s	M	---	---	---	5.5	---
13E:							
Elliber-----------	7e	M	---	---	---	---	---
14B:							
Ernest------------	2e	W	---	100	3.0	4.0	1900
14C:							
Ernest------------	3e	W	---	90	2.5	3.5	1800
15C:							
Faywood-----------	3e	U	3.5	95	3.0	5.0	2000
15D:							
Faywood-----------	4e	U	3.0	90	2.5	4.5	1800
15E:							
Faywood-----------	7e	U	---	---	---	---	---
16B:							
Frederick---------	2e	M	6.0	130	4.0	8.5	2800
16C:							
Frederick---------	3e	M	5.5	115	3.5	7.5	2600
16D:							
Frederick---------	4e	M	5.0	105	3.0	7.0	2300
16E:							
Frederick---------	7e	M	---	---	---	---	---
17C:							
Frederick---------	4s	M	4.0	85	2.5	6.5	2000
17D:							
Frederick---------	6s	M	---	---	---	6.0	---
17E:							
Frederick---------	7e	M	---	---	---	---	---
18D:							
Greenlee----------	7s	CC	---	---	---	---	---
19C, 19E:							
Hagerstown--------	7s	M	---	---	---	---	---
Rock outcrop------	8s	---	---	---	---	---	---

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
20C:							
Hagerstown--------	6s	M	---	---	---	7.0	---
20D:							
Hagerstown--------	6s	M	---	---	---	6.5	---
20E:							
Hagerstown--------	7e	M	---	---	---	---	---
21D:							
Hagerstown--------	7s	M	---	---	---	---	---
Rock outcrop------	8s	---	---	---	---	---	---
22C, 22D:							
Hagerstown--------	6s	M	---	---	---	7.0	---
23C:							
Hayter------------	3e	L	5.0	115	3.5	6.5	2000
23D:							
Hayter------------	4e	L	4.5	105	3.0	6.0	1600
24B:							
Ingledove---------	2e	A	6.0	160	5.0	9.0	2900
25C:							
Konnarock---------	4s	JJ	---	50	2.5	4.0	1400
25D:							
Konnarock---------	4e	JJ	---	45	2.0	3.5	1200
25E:							
Konnarock---------	7e	JJ	---	---	---	---	---
26B:							
Lily--------------	6s	U	---	---	---	5.0	---
26C:							
Lily--------------	6s	U	---	---	---	4.5	---
26D:							
Lily--------------	7s	U	---	---	---	---	---
26E:							
Lily--------------	7e	U	---	---	---	---	---
27D:							
Litz--------------	4e	JJ	---	50	2.5	3.5	1200
27E, 27F:							
Litz--------------	7e	JJ	---	---	---	---	---
28C:							
Litz--------------	3e	JJ	---	55	2.5	3.5	1400
Groseclose--------	3e	M	5.0	115	3.5	6.5	2400

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
28D:							
Litz--------------	4e	JJ	---	50	2.0	3.5	1200
Groseclose--------	4e	M	4.5	105	3.0	6.0	2100
28E:							
Litz--------------	7e	JJ	---	---	---	---	---
Groseclose--------	7e	M	---	---	---	---	---
29A:							
Lobdell-----------	2w	G	---	140	4.5	8.0	1500
30C, 30D:							
Macove------------	7s	CC	---	---	---	---	---
30E:							
Macove------------	7e	CC	---	---	---	---	---
31C:							
Macove------------	4s	CC	---	50	2.2	5.0	1500
31D:							
Macove------------	6s	CC	---	---	---	4.5	---
31E:							
Macove------------	7e	CC	---	---	---	---	---
32A:							
Maurertown--------	4w	NN	---	65	---	3.5	---
33A:							
Mongle------------	4w	H	---	130	3.0	4.0	---
34B:							
Monongahela-------	2e	W	---	100	3.0	4.0	1900
34C:							
Monongahela-------	3e	W	---	90	2.5	3.5	1800
35C:							
Pigeonroost-------	3e	U	3.5	95	3.0	5.0	1600
35D:							
Pigeonroost-------	4e	U	3.0	90	2.5	4.5	1400
35E:							
Pigeonroost-------	7e	U	---	---	---	---	---
36F:							
Rock outcrop------	8s	---	---	---	---	---	---
Opequon-----------	7s	JJ	---	---	---	---	---
37B:							
Shottower---------	2e	O	5.5	130	4.0	7.5	2700
37C:							
Shottower---------	3e	O	5.0	115	3.5	7.0	2600

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
37D:							
Shottower---------	4e	O	4.5	105	3.0	6.5	2000
38A:							
Sindion-----------	2w	B	---	160	4.5	8.5	2800
39A:							
Speedwell---------	1	A	6.0	160	4.5	9.0	2900
40B:							
Tate--------------	2e	O	5.5	130	4.0	7.5	2500
40C:							
Tate--------------	3e	O	5.0	115	3.5	7.0	2400
40D:							
Tate--------------	4e	O	4.5	105	3.0	6.5	2000
41B:							
Timberville-------	2w	G	5.5	140	4.5	9.0	3200
Marbie------------	3w	W	---	100	3.0	4.0	2100
42C:							
Timberville-------	3e	G	5.0	125	4.0	8.5	3100
Marbie------------	3e	W	---	90	2.5	3.5	2000
43B:							
Tumbling----------	6s	O	---	---	---	6.0	---
43C, 43D:							
Tumbling----------	7s	O	---	---	---	---	---
44B:							
Tumbling----------	2e	O	5.5	130	4.0	7.5	2700
44C:							
Tumbling----------	3e	O	5.0	115	3.5	7.0	2600
44D:							
Tumbling----------	4e	O	4.5	105	3.0	6.5	2000
44E:							
Tumbling----------	7e	O	---	---	---	---	---
45, 46. Udorthents							
47. Udorthents-Urban land							
48. Urban land							
49C:							
Watahala----------	4s	M	4.0	85	2.5	6.0	2000

Table 5.—Land Capability, Virginia Soil Management Group, and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Virginia Soil Management Group	Alfalfa hay	Corn	Grass-legume hay	Pasture	Tobacco
			Tons	Bu	Tons	AUM	Lbs
49D:							
Watahala----------	6s	M	---	---	---	5.5	---
49E:							
Watahala----------	7e	M	---	---	---	---	---
50D:							
Weikert-----------	6s	JJ	---	---	---	2.5	---
50E, 50F:							
Weikert-----------	7e	JJ	---	---	---	---	---
51C:							
Westmoreland------	3e	U	3.0	85	3.0	4.5	1600
51D:							
Westmoreland------	4e	U	2.5	80	2.5	4.0	1500
51E, 51F:							
Westmoreland------	7e	U	---	---	---	---	---
52D, 52E, 52F:							
Westmoreland------	7s	U	---	---	---	---	---
Rock outcrop------	8s	---	---	---	---	---	---
53B:							
Wheeling----------	2e	A	6.0	160	5.0	9.2	2900
54A:							
Wolfgap-----------	1	A	6.0	160	4.5	9.0	2900
55B:							
Wyrick------------	2e	G	5.5	140	4.5	8.0	2900
Marbie------------	2e	W	---	100	3.0	4.0	2100
55C:							
Wyrick------------	3e	G	5.0	125	4.0	7.5	2800
Marbie------------	3e	W	---	90	2.5	3.5	2000
55D:							
Wyrick------------	4e	G	4.5	110	3.5	6.5	2400
Marbie------------	4e	W	---	80	2.5	3.0	1600
W.							
Water							

Table 6.—Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Map unit name
1B	Allegheny loam, 2 to 7 percent slopes
5B	Botetourt loam, 2 to 7 percent slopes, rarely flooded
11B	Ebbing loam, 2 to 7 percent slopes, rarely flooded
14B	Ernest silt loam, 2 to 7 percent slopes
16B	Frederick silt loam, 2 to 7 percent slopes
24B	Ingledove loam, 2 to 7 percent slopes, rarely flooded
29A	Lobdell loam, 0 to 3 percent slopes, occasionally flooded
33A	Mongle loam, 0 to 3 percent slopes, rarely flooded (if drained)
34B	Monongahela silt loam, 2 to 7 percent slopes
37B	Shottower loam, 2 to 7 percent slopes
38A	Sindion silt loam, 0 to 3 percent slopes, occasionally flooded
39A	Speedwell loam, 0 to 3 percent slopes, occasionally flooded
40B	Tate loam, 2 to 7 percent slopes
44B	Tumbling loam, 2 to 7 percent slopes
53B	Wheeling loam, 2 to 7 percent slopes, rarely flooded
54A	Wolfgap fine sandy loam, 0 to 3 percent slopes, occasionally flooded
55B	Wyrick-Marbie complex, 2 to 7 percent slopes

Table 7.—Hydric Soils

Map symbol	Soil name
2A	Atkins loam, 0 to 3 percent slopes, frequently flooded
7A	Clubcaf silt loam, 0 to 3 percent slopes, frequently flooded
32A	Maurertown silt loam, 0 to 2 percent slopes, rarely flooded

Table 8.—Agricultural Waste Management, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1B:					
Allegheny	85	Somewhat limited		Somewhat limited	
		Too acid	0.27	Too acid	0.85
1C:					
Allegheny	85	Somewhat limited		Somewhat limited	
		Too acid	0.27	Too acid	0.85
		Slope	0.16	Slope	0.16
2A:					
Atkins	75	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00
3D:					
Berks	75	Very limited		Very limited	
		Droughty	1.00	Low adsorption	1.00
		Slope	1.00	Droughty	1.00
		Too acid	0.62	Too acid	1.00
3E, 3F:					
Berks	75	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Too acid	0.62	Droughty	1.00
4D, 4E:					
Bland	85	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	0.95	Slope	1.00
		Depth to bedrock	0.90	Droughty	0.95
5B:					
Botetourt	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too acid	0.02	Flooding	0.40
				Too acid	0.07
6D, 6E:					
Calvin	85	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	0.70	Too acid	1.00
		Too acid	0.62	Slope	1.00
6F:					
Calvin	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	0.70	Slope	1.00
		Too acid	0.62	Too acid	1.00

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
7A:					
Clubcaf	85	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00
8D:					
Dekalb	80	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Droughty	1.00	Low adsorption	1.00
		Filtering capacity	0.99	Slope	1.00
8E:					
Dekalb	85	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Droughty	1.00	Low adsorption	1.00
		Filtering capacity	0.99	Slope	1.00
9F:					
Drypond	45	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Low adsorption	1.00
Rock outcrop	30	Not rated		Not rated	
10F:					
Drypond	75	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Low adsorption	1.00
11B:					
Ebbing	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too acid	0.11	Too acid	0.42
				Flooding	0.40
12C:					
Edneytown	85	Somewhat limited		Somewhat limited	
		Too acid	0.37	Too acid	0.96
		Slope	0.37	Slope	0.37
12D, 12E:					
Edneytown	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.37	Too acid	0.96
13C:					
Elliber	80	Somewhat limited		Very limited	
		Too acid	0.94	Too acid	1.00
		Leaching	0.45	Droughty	0.39
		Droughty	0.39	Slope	0.37

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
13D, 13E:					
Elliber-------------	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.94	Too acid	1.00
		Leaching	0.45	Droughty	0.39
14B:					
Ernest--------------	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.46	Depth to cemented pan	0.46
		Too acid	0.11	Too acid	0.42
14C:					
Ernest--------------	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.46	Depth to cemented pan	0.46
		Slope	0.37	Too acid	0.42
15C:					
Faywood-------------	85	Somewhat limited		Very limited	
		Restricted permeability	0.81	Low adsorption	1.00
		Depth to bedrock	0.65	Restricted permeability	0.68
		Droughty	0.63	Depth to bedrock	0.65
15D, 15E:					
Faywood-------------	85	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Restricted permeability	0.81	Slope	1.00
		Depth to bedrock	0.65	Restricted permeability	0.68
16B:					
Frederick-----------	85	Somewhat limited		Somewhat limited	
		Too acid	0.05	Too acid	0.21
16C:					
Frederick-----------	80	Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37
		Too acid	0.05	Too acid	0.21
16D, 16E:					
Frederick-----------	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.05	Too acid	0.21
17C:					
Frederick-----------	85	Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37
		Too acid	0.05	Too acid	0.21
17D:					
Frederick-----------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.05	Too acid	0.21

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
17E:					
Frederick	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.05	Too acid	0.21
18D:					
Greenlee	85	Very limited		Very limited	
		Cobble content	1.00	Cobble content	1.00
		Too stony	1.00	Too acid	1.00
		Slope	1.00	Slope	1.00
19C:					
Hagerstown	45	Somewhat limited		Very limited	
		Too acid	0.27	Low adsorption	1.00
		Slope	0.04	Too acid	0.85
				Slope	0.04
Rock outcrop	30	Not rated		Not rated	
19E:					
Hagerstown	45	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Too acid	0.27	Slope	1.00
				Too acid	0.85
Rock outcrop	30	Not rated		Not rated	
20C:					
Hagerstown	80	Somewhat limited		Very limited	
		Slope	0.37	Low adsorption	1.00
		Too acid	0.27	Too acid	0.85
				Slope	0.37
20D, 20E:					
Hagerstown	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Too acid	0.27	Slope	1.00
				Too acid	0.85
21D:					
Hagerstown	45	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Too acid	0.27	Slope	1.00
				Too acid	0.85
Rock outcrop	30	Not rated		Not rated	
22C:					
Hagerstown	80	Somewhat limited		Very limited	
		Slope	0.37	Low adsorption	1.00
		Too acid	0.27	Too acid	0.85
				Slope	0.37
22D:					
Hagerstown	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Too acid	0.27	Slope	1.00
				Too acid	0.85

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
23C:					
Hayter	75	Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37
		Too acid	0.03	Too acid	0.14
23D:					
Hayter	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.03	Too acid	0.14
24B:					
Ingledove	80	Somewhat limited		Somewhat limited	
		Too acid	0.08	Flooding	0.40
				Too acid	0.31
25C:					
Konnarock	80	Very limited		Very limited	
		Droughty	1.00	Low adsorption	1.00
		Depth to bedrock	0.95	Droughty	1.00
		Slope	0.37	Depth to bedrock	0.95
25D, 25E:					
Konnarock	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Depth to bedrock	0.95	Droughty	1.00
26B, 26C:					
Lily	80	Somewhat limited		Very limited	
		Droughty	0.99	Low adsorption	1.00
		Too stony	0.94	Too acid	1.00
		Depth to bedrock	0.90	Droughty	0.99
26D, 26E:					
Lily	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	0.99	Slope	1.00
		Too stony	0.94	Too acid	1.00
27D, 27E:					
Litz	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Too acid	0.37	Droughty	1.00
27F:					
Litz	65	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Too acid	0.37	Droughty	1.00
28C:					
Litz	50	Very limited		Very limited	
		Droughty	1.00	Low adsorption	1.00
		Too acid	0.37	Droughty	1.00
		Slope	0.37	Too acid	0.96

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
28C:					
Groseclose----------	30	Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00
		Slope	0.63	Slope	0.63
		Too acid	0.11	Too acid	0.42
28D:					
Litz----------------	50	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Too acid	0.37	Droughty	1.00
Groseclose----------	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.11	Too acid	0.42
28E:					
Litz----------------	45	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Droughty	1.00	Slope	1.00
		Too acid	0.37	Droughty	1.00
Groseclose----------	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.11	Too acid	0.42
29A:					
Lobdell-------------	75	Very limited		Very limited	
		Depth to saturated zone	0.99	Flooding	1.00
		Flooding	0.60	Depth to saturated zone	0.99
		Too acid	0.11	Too acid	0.42
30C:					
Macove--------------	85	Very limited		Very limited	
		Too stony	1.00	Too acid	1.00
		Too acid	0.62	Slope	0.37
		Slope	0.37	Cobble content	0.12
30D, 30E:					
Macove--------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too stony	1.00	Too acid	1.00
		Too acid	0.62	Cobble content	0.12
31C:					
Macove--------------	75	Somewhat limited		Very limited	
		Too acid	0.62	Too acid	1.00
		Slope	0.37	Slope	0.37
31D, 31E:					
Macove--------------	75	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.62	Too acid	1.00

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
32A:					
Maurertown	80	Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
33A:					
Mongle	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Flooding	0.40
34B, 34C:					
Monongahela	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.71	Too acid	0.96
		Droughty	0.40	Depth to cemented pan	0.71
35C:					
Pigeonroost	80	Somewhat limited		Very limited	
		Slope	0.63	Low adsorption	1.00
		Too acid	0.37	Too acid	0.96
		Depth to bedrock	0.06	Slope	0.63
35D, 35E:					
Pigeonroost	80	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Too acid	0.37	Slope	1.00
		Depth to bedrock	0.06	Too acid	0.96
36F:					
Rock outcrop	40	Not rated		Not rated	
Opequon	30	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Low adsorption	1.00
37B:					
Shottower	85	Somewhat limited		Somewhat limited	
		Low adsorption	0.69	Too acid	0.96
		Too acid	0.37	Low adsorption	0.15
37C:					
Shottower	85	Somewhat limited		Somewhat limited	
		Low adsorption	0.69	Too acid	0.96
		Slope	0.63	Slope	0.63
		Too acid	0.37	Low adsorption	0.15
37D:					
Shottower	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Low adsorption	0.69	Too acid	0.96
		Too acid	0.37	Low adsorption	0.15

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
38A:					
Sindion	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00
39A:					
Speedwell	85	Somewhat limited		Very limited	
		Flooding	0.60	Flooding	1.00
40B:					
Tate	80	Somewhat limited		Somewhat limited	
		Too acid	0.11	Too acid	0.42
40C:					
Tate	80	Somewhat limited		Somewhat limited	
		Slope	0.37	Too acid	0.42
		Too acid	0.11	Slope	0.37
40D:					
Tate	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.11	Too acid	0.42
41B:					
Timberville	45	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Too acid	0.11	Too acid	0.42
Marbie	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Flooding	1.00	Flooding	1.00
		Dense layer	1.00	Depth to saturated zone	0.99
42C:					
Timberville	45	Somewhat limited		Somewhat limited	
		Slope	0.16	Too acid	0.42
		Too acid	0.11	Flooding	0.40
				Slope	0.16
Marbie	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dense layer	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96
43B:					
Tumbling	85	Somewhat limited		Somewhat limited	
		Too stony	0.76	Too acid	0.67
		Low adsorption	0.71	Low adsorption	0.09
		Too acid	0.18		

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
43C:					
Tumbling------------	85	Somewhat limited		Somewhat limited	
		Too stony	0.76	Too acid	0.67
		Low adsorption	0.71	Slope	0.37
		Slope	0.37	Low adsorption	0.09
43D:					
Tumbling------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too stony	0.76	Too acid	0.67
		Low adsorption	0.71	Low adsorption	0.09
44B:					
Tumbling------------	85	Somewhat limited		Somewhat limited	
		Low adsorption	0.71	Too acid	0.67
		Too acid	0.18	Low adsorption	0.09
44C:					
Tumbling------------	85	Somewhat limited		Somewhat limited	
		Low adsorption	0.71	Too acid	0.67
		Slope	0.37	Slope	0.37
		Too acid	0.18	Low adsorption	0.09
44D, 44E:					
Tumbling------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Low adsorption	0.71	Too acid	0.67
		Too acid	0.18	Low adsorption	0.09
45:					
Udorthents----------	70	Not rated		Not rated	
46:					
Udorthents----------	95	Not rated		Not rated	
47:					
Udorthents----------	40	Not rated		Not rated	
Urban land----------	35	Not rated		Not rated	
48:					
Urban land----------	85	Not rated		Not rated	
49C:					
Watahala------------	85	Somewhat limited		Very limited	
		Droughty	0.92	Too acid	1.00
		Too acid	0.78	Droughty	0.92
		Strongly contrasting textural stratification	0.46	Strongly contrasting textural stratification	0.46
49D, 49E:					
Watahala------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Droughty	0.92	Too acid	1.00
		Too acid	0.78	Droughty	0.92

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value
50D, 50E, 50F:					
Weikert	85	Very limited		Very limited	
		Slope	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Low adsorption	1.00
51C:					
Westmoreland	85	Somewhat limited		Very limited	
		Too acid	0.37	Low adsorption	1.00
		Slope	0.37	Too acid	0.96
		Droughty	0.18	Slope	0.37
51D, 51E, 51F:					
Westmoreland	85	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Too acid	0.37	Slope	1.00
		Droughty	0.18	Too acid	0.96
52D, 52E, 52F:					
Westmoreland	45	Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00
		Too acid	0.37	Slope	1.00
		Droughty	0.18	Too acid	0.96
Rock outcrop	30	Not rated		Not rated	
53B:					
Wheeling	80	Somewhat limited		Somewhat limited	
		Too acid	0.37	Too acid	0.96
				Flooding	0.40
54A:					
Wolfgap	85	Somewhat limited		Very limited	
		Flooding	0.60	Flooding	1.00
55B:					
Wyrick	50	Somewhat limited		Somewhat limited	
		Too acid	0.01	Too acid	0.01
Marbie	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dense layer	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96
55C:					
Wyrick	50	Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37
		Too acid	0.01	Too acid	0.01
Marbie	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dense layer	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96

Table 8.—Agricultural Waste Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
55D:					
Wyrick	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Too acid	0.01	Too acid	0.01
Marbie	30	Very limited		Very limited	
		Slope	1.00	Depth to cemented pan	1.00
		Depth to cemented pan	1.00	Slope	1.00
		Dense layer	1.00	Depth to saturated zone	0.99
W:					
Water	100	Not rated		Not rated	

Table 8.—Agricultural Waste Management, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
1B:					
Allegheny	85	Somewhat limited		Very limited	
		Too acid	0.85	Seepage	1.00
		Too steep for surface application	0.32	Too acid	0.85
1C:					
Allegheny	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	0.85	Too acid	0.85
		Too steep for sprinkler application	0.40	Too steep for surface application	0.78
2A:					
Atkins	75	Very limited		Very limited	
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
3D:					
Berks	75	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Droughty	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
3E, 3F:					
Berks	75	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Droughty	1.00	Seepage	1.00
4D, 4E:					
Bland	85	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Droughty	0.95	Seepage	1.00

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5B:					
Botetourt-----------	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too acid	0.07	Seepage	1.00
				Flooding	0.40
6D:					
Calvin--------------	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Depth to bedrock	1.00
				Too acid	1.00
		Too acid	1.00		
		Too steep for sprinkler application	1.00		
6E, 6F:					
Calvin--------------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Depth to bedrock	1.00
				Too steep for surface application	1.00
		Too steep for sprinkler application	1.00		
		Too acid	1.00		
7A:					
Clubcaf-------------	85	Very limited		Very limited	
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Ponding	1.00
				Depth to saturated zone	1.00
		Flooding	1.00		
8D:					
Dekalb--------------	80	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Too steep for surface application	1.00	Depth to bedrock	1.00
				Too steep for surface application	1.00
		Too steep for sprinkler application	1.00		
8E:					
Dekalb--------------	85	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Too steep for surface application	1.00	Depth to bedrock	1.00
				Too steep for surface application	1.00
		Too steep for sprinkler application	1.00		

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
9F:					
Drypond	45	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too steep for surface application	1.00	Too steep for surface application	1.00
Rock outcrop	30	Not rated		Not rated	
10F:					
Drypond	75	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too steep for surface application	1.00	Too steep for surface application	1.00
11B:					
Ebbing	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too acid	0.42	Seepage	1.00
				Too acid	0.42
12C:					
Edneytown	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Too acid	0.96
				Too steep for surface application	0.94
		Too acid	0.96		
		Too steep for sprinkler application	0.60		
12D, 12E:					
Edneytown	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Too acid	0.96
		Too acid	0.96		
13C:					
Elliber	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Too acid	1.00
				Too steep for surface application	0.94
		Too acid	1.00		
		Too steep for sprinkler application	0.60		

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
13D, 13E:					
Elliber	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	1.00	Too acid	1.00
14B:					
Ernest	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	0.46	Depth to cemented pan	1.00
		Too acid	0.42	Seepage	1.00
14C:					
Ernest	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too steep for surface application	1.00	Depth to cemented pan	1.00
		Too steep for sprinkler application	0.60	Seepage	1.00
15C:					
Faywood	85	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Restricted permeability	0.68	Seepage	1.00
		Depth to bedrock	0.65	Too steep for surface application	0.94
15D, 15E:					
Faywood	85	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Restricted permeability	0.68	Seepage	1.00
16B:					
Frederick	85	Somewhat limited		Very limited	
		Too steep for surface application	0.32	Seepage	1.00
		Too acid	0.21	Too acid	0.21

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
16C:					
Frederick-----------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	0.60	Too steep for surface application	0.94
		Too acid	0.21	Too acid	0.21
16D, 16E:					
Frederick-----------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	0.21	Too acid	0.21
17C:					
Frederick-----------	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	0.60	Too steep for surface application	0.94
		Too acid	0.21	Too acid	0.21
17D:					
Frederick-----------	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	0.21	Too acid	0.21
17E:					
Frederick-----------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	0.21	Too acid	0.21
18D:					
Greenlee------------	85	Very limited		Very limited	
		Cobble content	1.00	Seepage	1.00
		Too steep for surface application	1.00	Cobble content	1.00
		Too acid	1.00	Too acid	1.00

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
19C:					
Hagerstown----------	45	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Too acid	0.85
				Too steep for surface application	0.50
		Too acid	0.85		
		Too steep for sprinkler application	0.22		
Rock outcrop--------	30	Not rated		Not rated	
19E:					
Hagerstown----------	45	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
				Too acid	0.85
		Too acid	0.85		
Rock outcrop--------	30	Not rated		Not rated	
20C:					
Hagerstown----------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Too steep for surface application	0.94
		Too acid	0.85		
		Too steep for sprinkler application	0.60	Too acid	0.85
20D, 20E:					
Hagerstown----------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
				Too acid	0.85
		Too acid	0.85		
21D:					
Hagerstown----------	45	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
				Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Too acid	0.85
		Too acid	0.85		
Rock outcrop--------	30	Not rated		Not rated	

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
22C:					
Hagerstown	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	0.85	Too steep for surface application	0.94
		Too steep for sprinkler application	0.60	Too acid	0.85
22D:					
Hagerstown	80	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
		Too acid	0.85	Too acid	0.85
23C:					
Hayter	75	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	0.60	Too steep for surface application	0.94
		Too acid	0.14	Too acid	0.14
23D:					
Hayter	70	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	0.14	Too acid	0.14
24B:					
Ingledove	80	Somewhat limited		Very limited	
		Too acid	0.31	Seepage	1.00
				Flooding	0.40
				Too acid	0.31
25C:					
Konnarock	80	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Depth to bedrock	0.95	Too steep for surface application	0.94

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
25D, 25E:					
Konnarock-----------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Depth to bedrock	1.00
		Droughty	1.00	Too steep for surface application	1.00
26B:					
Lily----------------	80	Very limited		Very limited	
		Too acid	1.00	Depth to bedrock	1.00
		Droughty	0.99	Seepage	1.00
		Depth to bedrock	0.90	Too acid	1.00
26C:					
Lily----------------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too acid	1.00	Seepage	1.00
		Droughty	0.99	Too acid	1.00
26D, 26E:					
Lily----------------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	1.00	Seepage	1.00
27D, 27E:					
Litz----------------	80	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Droughty	1.00	Seepage	1.00
27F:					
Litz----------------	65	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Droughty	1.00	Seepage	1.00

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
28C:					
Litz	50	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Droughty	1.00	Seepage	1.00
		Too acid	0.96	Too acid	0.96
Groseclose	30	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	0.78	Too acid	0.42
28D:					
Litz	50	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Droughty	1.00	Seepage	1.00
Groseclose	30	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Restricted permeability	1.00	Too acid	0.42
28E:					
Litz	45	Very limited		Very limited	
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Droughty	1.00	Seepage	1.00
Groseclose	30	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Restricted permeability	1.00	Too acid	0.42

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
29A:					
Lobdell	75	Very limited		Very limited	
		Depth to saturated zone	0.99	Flooding	1.00
		Flooding	0.60	Seepage	1.00
		Too acid	0.42	Depth to saturated zone	0.99
30C:					
Macove	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	1.00	Too acid	1.00
		Too steep for sprinkler application	0.60	Stone content	1.00
30D, 30E:					
Macove	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	1.00	Too acid	1.00
31C:					
Macove	75	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	1.00	Too acid	1.00
		Too steep for sprinkler application	0.60	Too steep for surface application	0.94
31D, 31E:					
Macove	75	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	1.00	Too acid	1.00
32A:					
Maurertown	80	Very limited		Very limited	
		Restricted permeability	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	1.00

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
33A:					
Mongle	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Seepage	1.00
				Flooding	0.40
34B:					
Monongahela	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too acid	0.96	Depth to cemented pan	1.00
		Depth to cemented pan	0.71	Seepage	1.00
34C:					
Monongahela	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too steep for surface application	1.00	Depth to cemented pan	1.00
		Too acid	0.96	Seepage	1.00
35C:					
Pigeonroost	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	0.96	Depth to bedrock	1.00
		Too steep for sprinkler application	0.78	Too steep for surface application	1.00
35D, 36E:					
Pigeonroost	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Depth to bedrock	1.00
		Too acid	0.96	Too steep for surface application	1.00
36F:					
Rock outcrop	40	Not rated		Not rated	
Opequon	30	Very limited		Very limited	
		Droughty	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep for surface application	1.00
		Too steep for surface application	1.00	Seepage	1.00

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
37B:					
Shottower	85	Somewhat limited		Very limited	
		Too acid	0.96	Seepage	1.00
		Low adsorption	0.69	Too acid	0.96
		Too steep for surface application	0.08	Low adsorption	0.69
37C:					
Shottower	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	0.96	Too steep for surface application	1.00
		Too steep for sprinkler application	0.78	Too acid	0.96
37D:					
Shottower	85	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
		Too acid	0.96	Too acid	0.96
38A:					
Sindion	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.60	Depth to saturated zone	1.00
				Seepage	1.00
39A:					
Speedwell	85	Somewhat limited		Very limited	
		Flooding	0.60	Flooding	1.00
				Seepage	1.00
40B:					
Tate	80	Somewhat limited		Very limited	
		Too acid	0.42	Seepage	1.00
		Too steep for surface application	0.32	Too acid	0.42
40C:					
Tate	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	0.60	Too steep for surface application	0.94
		Too acid	0.42	Too acid	0.42

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
40D:					
Tate	80	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	0.42	Too acid	0.42
41B:					
Timberville	45	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Too acid	0.42	Seepage	1.00
		Too steep for surface application	0.32	Too acid	0.42
Marbie	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Flooding	1.00
		Flooding	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	0.99	Seepage	1.00
42C:					
Timberville	45	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	0.42	Too steep for surface application	0.78
		Too steep for sprinkler application	0.40	Too acid	0.42
Marbie	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too steep for surface application	1.00	Seepage	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
43B:					
Tumbling	85	Somewhat limited		Very limited	
		Low adsorption	0.71	Seepage	1.00
		Too acid	0.67	Low adsorption	0.71
		Too steep for surface application	0.08	Too acid	0.67
43C:					
Tumbling	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Low adsorption	0.71	Too steep for surface application	0.94
		Too acid	0.67	Low adsorption	0.71

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
43D:					
Tumbling	85	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
		Low adsorption	0.71	Low adsorption	0.71
44B:					
Tumbling	85	Somewhat limited		Very limited	
		Low adsorption	0.71	Seepage	1.00
		Too acid	0.67	Low adsorption	0.71
		Too steep for surface application	0.08	Too acid	0.67
44C:					
Tumbling	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Low adsorption	0.71	Too steep for surface application	0.94
		Too acid	0.67	Low adsorption	0.71
44D, 44E:					
Tumbling	85	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
		Low adsorption	0.71	Low adsorption	0.71
45:					
Udorthents	70	Not rated		Not rated	
46:					
Udorthents	95	Not rated		Not rated	
47:					
Udorthents	40	Not rated		Not rated	
Urban land	35	Not rated		Not rated	
48:					
Urban land	85	Not rated		Not rated	
49C:					
Watahala	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	1.00	Too acid	1.00
		Droughty	0.92	Too steep for surface application	0.94

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
49D, 49E:					
Watahala	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	1.00	Too acid	1.00
50D, 50E, 50F:					
Weikert	85	Very limited		Very limited	
		Droughty	1.00	Seepage	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Too steep for surface application	1.00	Too steep for surface application	1.00
51C:					
Westmoreland	85	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too acid	0.96	Too acid	0.96
		Too steep for sprinkler application	0.60	Too steep for surface application	0.94
51D, 51E, 51F:					
Westmoreland	85	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
		Too acid	0.96	Too acid	0.96
52D:					
Westmoreland	45	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Too acid	0.96	Too acid	0.96
Rock outcrop	30	Not rated		Not rated	
52E, 52F:					
Westmoreland	45	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
		Too acid	0.96	Too acid	0.96

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation: Rating class and limiting features	Value	Overland flow of wastewater: Rating class and limiting features	Value
52E, 52F:					
Rock outcrop--------	30	Not rated		Not rated	
53B:					
Wheeling------------	80	Somewhat limited		Very limited	
		Too acid	0.96	Seepage	1.00
		Too steep for surface application	0.32	Too acid	0.96
				Flooding	0.40
54A:					
Wolfgap-------------	85	Somewhat limited		Very limited	
		Flooding	0.60	Flooding	1.00
				Seepage	1.00
55B:					
Wyrick--------------	50	Somewhat limited		Very limited	
		Too steep for surface application	0.32	Seepage	1.00
		Too acid	0.01	Too acid	0.01
Marbie--------------	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	0.99	Seepage	1.00
		Too acid	0.96	Depth to saturated zone	0.99
55C:					
Wyrick--------------	50	Very limited		Very limited	
		Too steep for surface application	1.00	Seepage	1.00
		Too steep for sprinkler application	0.60	Too steep for surface application	0.94
		Too acid	0.01	Too acid	0.01
Marbie--------------	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too steep for surface application	1.00	Seepage	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
55D:					
Wyrick--------------	50	Very limited		Very limited	
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
		Too acid	0.01	Too acid	0.01

Table 8.—Agricultural Waste Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
55D:					
Marbie	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Seepage	1.00
W:					
Water	100	Not rated		Not rated	

Table 8.—Agricultural Waste Management, Part III

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
1B:					
Allegheny	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.85
		Slope	0.12	Too steep	0.32
1C:					
Allegheny	85	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.85
2A:					
Atkins	75	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	1.00
		Slow water movement	1.00	Too acid	0.85
3D:					
Berks	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	1.00
		Too acid	0.03		
3E, 3F:					
Berks	75	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.22	Too acid	1.00
		Too acid	0.03		
4D, 4E:					
Bland	85	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Depth to bedrock	1.00	Too acid	0.42
				Slow water movement	0.26
5B:					
Botetourt	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Too acid	0.07

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
6D:					
Calvin	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
		Too acid	0.03		
6E, 6F:					
Calvin	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
		Too acid	0.03		
7A:					
Clubcaf	85	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	1.00
		Slow water movement	1.00	Too acid	0.01
8D:					
Dekalb	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Too acid	0.14	Too acid	1.00
				Filtering capacity	0.99
8E:					
Dekalb	85	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Too acid	0.14	Too acid	1.00
				Filtering capacity	0.99
9F:					
Drypond	45	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Too acid	0.03	Too acid	1.00
				Filtering capacity	0.99
Rock outcrop	30	Not rated		Not rated	
10F:					
Drypond	75	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Too acid	0.03	Too acid	1.00
				Filtering capacity	0.99

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
11B:					
Ebbing	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Too acid	0.42
12C:					
Edneytown	85	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.96
		Too acid	0.14		
12D, 12E:					
Edneytown	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
		Too acid	0.14		
13C, 13D, 13E:					
Elliber	80	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Too acid	0.77	Too acid	1.00
		Slow water movement	0.62		
14B:					
Ernest	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Too acid	0.42
		Slope	0.12	Too steep	0.32
14C:					
Ernest	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.42
15C:					
Faywood	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slope	1.00	Slow water movement	0.50
				Too acid	0.01

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
15D, 15E:					
Faywood	85	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
		Depth to bedrock	1.00	Slow water movement	0.50
				Too acid	0.01
16B:					
Frederick	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Too steep	0.32
		Slope	0.12	Too acid	0.21
16C:					
Frederick	80	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.21
16D, 16E:					
Frederick	80	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.21
17C:					
Frederick	85	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.21
17D:					
Frederick	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.21
17E:					
Frederick	80	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.21
18D:					
Greenlee	85	Very limited		Very limited	
		Cobble content	1.00	Cobble content	1.00
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
		Too acid	0.03		
19C:					
Hagerstown	45	Very limited		Very limited	
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
		Slope	1.00	Depth to bedrock	0.42
Rock outcrop	30	Not rated		Not rated	

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
19E:					
Hagerstown----------	45	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Depth to bedrock	1.00	Too acid	0.85
		Slow water movement	1.00	Depth to bedrock	0.42
Rock outcrop--------	30	Not rated		Not rated	
20C:					
Hagerstown----------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
				Depth to bedrock	0.42
		Slope	1.00		
20D, 20E:					
Hagerstown----------	80	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Depth to bedrock	1.00	Too acid	0.85
		Slow water movement	1.00	Depth to bedrock	0.42
21D:					
Hagerstown----------	45	Very limited		Very limited	
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
				Depth to bedrock	0.42
		Slope	1.00		
Rock outcrop--------	30	Not rated		Not rated	
22C:					
Hagerstown----------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.85
				Depth to bedrock	0.42
		Slope	1.00		
22D:					
Hagerstown----------	80	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Depth to bedrock	1.00	Too acid	0.85
		Slow water movement	1.00	Depth to bedrock	0.42
23C:					
Hayter--------------	75	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.14
23D:					
Hayter--------------	70	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.14

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
24B:					
Ingledove-----------	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.31
25C:					
Konnarock-----------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.91
25D, 25E:					
Konnarock-----------	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	0.91
26B:					
Lily----------------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	0.62	Too acid	1.00
				Too steep	0.32
		Too acid	0.14		
		Slope	0.12		
26C:					
Lily----------------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Too steep	1.00
		Slow water movement	0.62	Too acid	1.00
		Too acid	0.14		
26D, 26E:					
Lily----------------	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.62	Too acid	1.00
		Too acid	0.14		
27D, 27E, 27F:					
Litz----------------	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
28C:					
Litz----------------	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.96
		Slope	1.00		
Groseclose----------	30	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Slow water movement	0.96
		Slope	1.00		
		Too acid	0.03	Too acid	0.42
28D:					
Litz----------------	50	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
Groseclose----------	30	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Slow water movement	0.96
		Too acid	0.03	Too acid	0.42
28E:					
Litz----------------	45	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
Groseclose----------	30	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Slow water movement	0.96
		Too acid	0.03	Too acid	0.42
29A:					
Lobdell-------------	75	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Slow water movement	1.00	Flooding	0.60
				Too acid	0.42
		Flooding	0.60		
30C, 30D, 30E:					
Macove--------------	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Stone content	1.00	Too acid	1.00
		Cobble content	0.85	Cobble content	0.12
		Slow water movement	0.32		
		Too acid	0.03		

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
31C, 31D, 31E:					
Macove	75	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
		Too acid	0.03		
32A:					
Maurertown	80	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slow water movement	1.00
33A:					
Mongle	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
34B:					
Monongahela	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Too acid	0.96
				Too steep	0.32
		Slope	0.12		
34C:					
Monongahela	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.96
		Slope	1.00		
35C:					
Pigeonroost	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.96
		Slope	1.00		
35D, 35E:					
Pigeonroost	80	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
36F:					
Rock outcrop	40	Not rated		Not rated	
Opequon	30	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00		
37B:					
Shottower	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.96
				Low adsorption	0.69
				Too steep	0.08
37C:					
Shottower	85	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.96
		Slope	1.00	Low adsorption	0.69
37D:					
Shottower	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
				Low adsorption	0.69
38A:					
Sindion	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.60
		Flooding	0.60		
39A:					
Speedwell	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Flooding	0.60
		Flooding	0.60		
40B:					
Tate	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.42
				Too steep	0.32
		Slope	0.12		
40C:					
Tate	80	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
				Too acid	0.42
		Slope	1.00		
40D:					
Tate	80	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.42

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
41B:					
Timberville	45	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Too acid	0.42
		Slope	0.12	Too steep	0.32
		Too acid	0.03		
Marbie	35	Very limited		Very limited	
		Flooding	1.00	Depth to cemented pan	1.00
		Depth to cemented pan	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96
42C:					
Timberville	45	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.42
		Too acid	0.03		
Marbie	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96
43B:					
Tumbling	85	Very limited		Somewhat limited	
		Slow water	1.00	Low adsorption	0.71
		movement	1.00	Too acid	0.67
				Too steep	0.08
43C:					
Tumbling	85	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Low adsorption	0.71
				Too acid	0.67
43D:					
Tumbling	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Low adsorption	0.71
				Too acid	0.67
44B:					
Tumbling	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Low adsorption	0.71
				Too acid	0.67
				Too steep	0.08

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
44C:					
Tumbling-----------	85	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Low adsorption	0.71
				Too acid	0.67
44D, 44E:					
Tumbling-----------	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Low adsorption	0.71
				Too acid	0.67
45:					
Udorthents----------	70	Not rated		Not rated	
46:					
Udorthents----------	95	Not rated		Not rated	
47:					
Udorthents----------	40	Not rated		Not rated	
Urban land----------	35	Not rated		Not rated	
48:					
Urban land----------	85	Not rated		Not rated	
49C:					
Watahala-----------	85	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	1.00
		Too acid	0.21		
49D, 49E:					
Watahala-----------	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	1.00
		Too acid	0.21		
50D, 50E, 50F:					
Weikert-------------	85	Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	0.32	Too acid	1.00
		Too acid	0.03		
51C:					
Westmoreland--------	85	Very limited		Very limited	
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
		Slope	1.00	Depth to bedrock	0.32
51D, 51E, 51F:					
Westmoreland--------	85	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Depth to bedrock	1.00	Too acid	0.96
		Slow water movement	1.00	Depth to bedrock	0.32

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
52D:					
Westmoreland--------	45	Very limited		Very limited	
		Depth to bedrock	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.96
		Slope	1.00	Depth to bedrock	0.32
Rock outcrop--------	30	Not rated		Not rated	
52E, 52F:					
Westmoreland--------	45	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Depth to bedrock	1.00	Too acid	0.96
		Slow water movement	1.00	Depth to bedrock	0.32
Rock outcrop--------	30	Not rated		Not rated	
53B:					
Wheeling------------	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Too acid	0.96
		Slope	0.12	Too steep	0.32
54A:					
Wolfgap-------------	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Flooding	0.60
		Flooding	0.60		
55B:					
Wyrick--------------	50	Very limited		Somewhat limited	
		Slow water movement	1.00	Too steep	0.32
		Slope	0.12	Too acid	0.01
		Too acid	0.03		
Marbie--------------	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96
		Slope	0.12	Too steep	0.32
55C:					
Wyrick--------------	50	Very limited		Very limited	
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Too acid	0.01
		Too acid	0.03		
Marbie--------------	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Too steep	1.00
		Slope	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96

Table 8.—Agricultural Waste Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
55D:					
Wyrick	50	Very limited		Very limited	
		Slope	1.00	Too steep	1.00
		Slow water movement	1.00	Too acid	0.01
		Too acid	0.03		
Marbie	30	Very limited		Very limited	
		Slope	1.00	Depth to cemented pan	1.00
		Depth to cemented pan	1.00	Too steep	1.00
		Slow water movement	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	0.99	Too acid	0.96
W:					
Water	100	Not rated		Not rated	

Table 9.—Forestland Productivity

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
1B, 1C:				
Allegheny	northern red oak	80	62	northern red oak, black oak, eastern white pine, white oak, yellow-poplar
	black oak	75	57	
	red maple	---	---	
	sugar maple	---	---	
	white oak	---	---	
	yellow-poplar	95	98	
2A:				
Atkins	American sycamore	---	---	sweetgum, swamp white oak
	green ash	---	---	
	red maple	---	---	
	swamp white oak	---	---	
	sweetgum	100	138	
3D, 3E, 3F:				
Berks	northern red oak	65	47	northern red oak, black oak, white oak, eastern white pine
	black oak	60	43	
	white oak	60	43	
	chestnut oak	60	43	
	hickory	---	---	
4D, 4E:				
Bland	northern red oak	65	47	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	red maple	---	---	
	yellow-poplar	80	70	
5B:				
Botetourt	yellow-poplar	115	130	black walnut, eastern white pine, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
6D, 6E, 6F:				
Calvin	northern red oak	65	47	northern red oak, eastern white pine, black oak, white oak
	black oak	60	43	
	white oak	60	43	
	chestnut oak	60	43	
	hickory	---	---	
7A:				
Clubcaf	American sycamore	---	---	sweetgum, swamp white oak
	green ash	---	---	
	red maple	---	---	
	swamp white oak	---	---	
	sweetgum	100	138	
8D, 8E:				
Dekalb	chestnut oak	55	39	chestnut oak, eastern white pine, black oak, white oak
	scarlet oak	55	39	
	black oak	55	39	
	white oak	55	39	
	Virginia pine	---	---	
	pitch pine	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
9F:				
Drypond	chestnut oak	50	35	chestnut oak, eastern white pine, black oak, white oak, Table Mountain pine
	scarlet oak	45	30	
	black oak	50	35	
	white oak	50	35	
	Virginia pine	---	---	
	Table Mountain pine	---	---	
Rock outcrop.				
10F:				
Drypond	chestnut oak	50	35	chestnut oak, eastern white pine, black oak, white oak, Table Mountain pine
	scarlet oak	45	30	
	black oak	50	35	
	white oak	50	35	
	Virginia pine	---	---	
	Table Mountain pine	---	---	
11B:				
Ebbing	yellow-poplar	115	130	black walnut, eastern white pine, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
12C, 12D, 12E:				
Edneytown	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	white oak	75	57	
	hickory	70	44	
	yellow-poplar	110	123	
	eastern white pine	115	---	
	pitch pine	80	---	
13C, 13D, 13E:				
Elliber	northern red oak	80	62	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	75	57	
	yellow-poplar	90	90	
14B, 14C:				
Ernest	northern red oak	80	62	northern red oak, eastern white pine, yellow-poplar
	sugar maple	80	62	
	yellow-poplar	90	90	
15C, 15D, 15E:				
Faywood	northern red oak	65	47	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	red maple	---	---	
	yellow-poplar	80	70	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
16B, 16C, 16D, 16E, 17C, 17D, 17E:				
Frederick	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	70	52	
	yellow-poplar	90	90	
18D:				
Greenlee	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	eastern white pine	85	162	
	red maple	---	---	
	sugar maple	---	---	
	white oak	70	52	
	yellow-poplar	100	107	
19C, 19E:				
Hagerstown	northern red oak	80	62	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	75	57	
	yellow-poplar	95	98	
Rock outcrop.				
20C, 20D, 20E:				
Hagerstown	northern red oak	80	62	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	75	57	
	yellow-poplar	95	98	
21D:				
Hagerstown	northern red oak	80	65	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	75	57	
	yellow-poplar	95	98	
Rock outcrop.				
22C, 22D:				
Hagerstown	northern red oak	80	62	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	75	57	
	yellow-poplar	95	98	
23C, 23D:				
Hayter	northern red oak	85	65	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	80	62	
	yellow-poplar	95	98	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
24B:				
Ingledove	yellow-poplar	115	130	white ash, eastern white pine, walnut, yellow-poplar
	walnut	80	62	
	white ash	95	---	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
25C, 25D, 25E:				
Konnarock	northern red oak	75	57	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	hickory	---	---	
	black oak	70	52	
	white oak	70	52	
	yellow-poplar	80	70	
26B, 26C, 26D, 26E:				
Lily	northern red oak	65	47	northern red oak, chestnut oak, eastern white pine, white oak, black oak
	chestnut oak	60	43	
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	red maple	---	---	
27D, 27E, 27F:				
Litz	northern red oak	65	47	northern red oak, chestnut oak, eastern white pine, black oak, white oak
	chestnut oak	60	43	
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
28C, 28D, 28E:				
Litz	northern red oak	65	47	northern red oak, chestnut oak, eastern white pine, black oak, white oak
	chestnut oak	60	43	
	black oak	60	43	
	white oak	60	43	
	hickory	---	---	
	eastern white pine	80	144	
Groseclose	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	white oak	70	52	
	yellow-poplar	90	90	
	red maple	---	---	
	sugar maple	65	41	
	eastern white pine	85	162	
29A:				
Lobdell	yellow-poplar	95	98	walnut, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
30C, 30D, 30E, 31C, 31D, 31E:				
Macove	northern red oak	80	62	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	75	57	
	yellow-poplar	90	90	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
32A:				
Maurertown	American sycamore	---	---	sweetgum, swamp white oak
	green ash	---	---	
	red maple	---	---	
	swamp white oak	---	---	
	sweetgum	100	138	
33A:				
Mongle	black walnut	75	53	sweetgum, walnut, swamp white oak
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
	sweetgum	90	106	
34B, 34C:				
Monongahela	northern red oak	70	52	northern red oak, black walnut, eastern white pine, yellow-poplar
	black walnut	---	---	
	Virginia pine	65	100	
	yellow-poplar	85	80	
35C, 35D, 35E:				
Pigeonroost	eastern white pine	95	175	eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	white oak	70	52	
	yellow-poplar	90	90	
36F:				
Rock outcrop.				
Opequon	chestnut oak	50	35	---
	scarlet oak	50	35	
	black oak	50	35	
	white oak	50	35	
	eastern redcedar	35	40	
37B, 37C, 37D:				
Shottower	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	70	52	
	yellow-poplar	90	90	
38A:				
Sindion	yellow-poplar	95	98	walnut, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
39A:				
Speedwell	yellow-poplar	95	98	walnut, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
40B, 40C, 40D:				
Tate	northern red oak	75	57	northern red oak, eastern white pine, yellow-poplar
	red maple	---	---	
	sugar maple	---	---	
	yellow-poplar	100	107	
	eastern white pine	100	191	
41B, 42C:				
Timberville	northern red oak	90	70	northern red oak, black walnut, eastern white pine, yellow-poplar
	white oak	85	65	
	red maple	---	---	
	sugar maple	65	41	
	yellow-poplar	95	98	
Marbie	northern red oak	70	52	northern red oak, black walnut, eastern white pine, white oak, yellow-poplar
	black walnut	80	62	
	red maple	---	---	
	sugar maple	65	41	
	white oak	65	47	
	yellow-poplar	85	80	
43B, 43C, 43D, 44B, 44C, 44D, 44E:				
Tumbling	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	70	52	
	yellow-poplar	90	90	
45, 46. Udorthents				
47. Udorthents-Urban land				
48. Urban land				
49C, 49D, 49E:				
Watahala	northern red oak	75	57	northern red oak, eastern white pine, white oak, yellow-poplar
	red maple	---	---	
	sugar maple	65	41	
	white oak	70	52	
	yellow-poplar	90	90	
50D, 50E, 50F:				
Weikert	chestnut oak	50	35	chestnut oak, eastern white pine, black oak, white oak
	scarlet oak	50	35	
	black oak	50	35	
	white oak	50	35	
	Virginia pine	---	---	
	pitch pine	---	---	
51C, 51D, 51E, 51F:				
Westmoreland	northern red oak	70	52	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	65	47	
	white oak	65	47	
	red maple	---	---	
	hickory	---	---	
	yellow-poplar	90	90	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
52D, 52E, 52F:				
Westmoreland	northern red oak	70	52	northern red oak, eastern white pine, black oak, white oak, yellow-poplar
	black oak	65	47	
	white oak	65	47	
	red maple	---	---	
	hickory	---	---	
	yellow-poplar	90	90	
Rock outcrop.				
53B:				
Wheeling	yellow-poplar	115	130	white ash, eastern white pine, walnut, yellow-poplar
	walnut	80	62	
	white ash	95	---	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
54A:				
Wolfgap	yellow-poplar	95	98	walnut, yellow-poplar
	black walnut	80	62	
	American sycamore	---	---	
	green ash	---	---	
	red maple	---	---	
55B, 55C, 55D:				
Wyrick	northern red oak	85	65	northern red oak, black walnut, eastern white pine, white oak, yellow-poplar
	black walnut	85	65	
	red maple	---	---	
	sugar maple	65	41	
	white oak	80	62	
	yellow-poplar	95	98	
Marbie	northern red oak	70	52	northern red oak, black walnut, eastern white pine, white oak, yellow-poplar
	black walnut	80	62	
	red maple	---	---	
	sugar maple	65	41	
	white oak	65	47	
	yellow-poplar	85	80	
W.				
Water				

Table 10.—Forestland Management, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1B:							
Allegheny-----	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
1C:							
Allegheny-----	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
2A:							
Atkins--------	75	Severe		Poorly suited		Severe	
		Flooding	1.00	Ponding	1.00	Low strength	1.00
		Wetness	1.00	Flooding	1.00		
		Low strength	0.50	Wetness	0.50		
3D:							
Berks---------	75	Moderate		Poorly suited		Severe	
		Restrictive layer	0.50	Slope	1.00	Low strength	1.00
		Slope	0.50				
3E, 3F:							
Berks---------	75	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
4D:							
Bland---------	85	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Low strength	0.50				
4E:							
Bland---------	85	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
5B:							
Botetourt-----	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
6D:							
Calvin--------	85	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Sandiness	0.50				
6E, 6F:							
Calvin--------	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
				Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7A:							
Clubcaf--------	85	Severe		Poorly suited		Severe	
		Flooding	1.00	Ponding	1.00	Low strength	1.00
		Wetness	1.00	Flooding	1.00		
		Low strength	0.50	Low strength	0.50		
8D:							
Dekalb---------	80	Severe		Poorly suited		Moderate	
		Restrictive layer	1.00	Slope	1.00	Low strength	0.50
		Slope	0.50				
		Sandiness	0.50				
8E:							
Dekalb---------	85	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
9F:							
Drypond--------	45	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
10F:							
Drypond--------	75	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
11B:							
Ebbing---------	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
12C:							
Edneytown------	85	Slight		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
				Low strength	0.50		
12D, 12E:							
Edneytown------	85	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
13C:							
Elliber--------	80	Slight		Moderately suited		Slight	
				Slope	0.50	Strength	0.10
13D:							
Elliber--------	80	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
13E:							
Elliber--------	80	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
14B:							
Ernest---------	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
14C:							
Ernest--------	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
15C:							
Faywood-------	85	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
15D:							
Faywood-------	85	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Low strength	0.50				
15E:							
Faywood-------	85	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
16B:							
Frederick-----	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
16C:							
Frederick-----	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
16D:							
Frederick-----	80	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
16E:							
Frederick-----	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
17C:							
Frederick-----	85	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
17D:							
Frederick-----	85	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Low strength	0.50				
17E:							
Frederick-----	80	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Low strength	0.50				
18D:							
Greenlee------	85	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Stoniness	0.50	Rock fragments	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
19C:							
Hagerstown----	45	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Rock outcrop--	30	Not rated		Not rated		Not rated	
19E:							
Hagerstown----	45	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Restrictive layer	0.50	Low strength	0.50		
		Low strength	0.50				
Rock outcrop--	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown----	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
20D:							
Hagerstown----	80	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
		Restrictive layer	0.50				
20E:							
Hagerstown----	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
21D:							
Hagerstown----	45	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Restrictive layer	0.50	Low strength	0.50		
		Low strength	0.50				
Rock outcrop--	30	Not rated		Not rated		Not rated	
22C:							
Hagerstown----	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
22D:							
Hagerstown----	80	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
		Restrictive layer	0.50				
23C:							
Hayter--------	75	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
23D:							
Hayter--------	70	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
24B:							
Ingledove-----	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
25C:							
Konnarock-----	80	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
25D:							
Konnarock-----	80	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50				
25E:							
Konnarock-----	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
26B:							
Lily----------	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
		Restrictive layer	0.50				
26C:							
Lily----------	80	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
26D:							
Lily----------	80	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Low strength	0.50				
26E:							
Lily----------	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
27D:							
Litz----------	80	Moderate		Poorly suited		Severe	
		Restrictive layer	0.50	Slope	1.00	Low strength	1.00
		Slope	0.50				
27E:							
Litz----------	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
27F:							
Litz----------	65	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
28C:							
Litz----------	50	Moderate		Moderately suited		Severe	
		Restrictive layer	0.50	Slope	0.50	Low strength	1.00
Groseclose----	30	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
28D:							
Litz----------	50	Moderate		Poorly suited		Severe	
		Restrictive layer	0.50	Slope	1.00	Low strength	1.00
		Slope	0.50				
Groseclose----	30	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
28E:							
Litz----------	45	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
Groseclose----	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
29A:							
Lobdell-------	75	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
30C:							
Macove--------	85	Severe		Poorly suited		Severe	
		Stoniness	1.00	Rock fragments	1.00	Low strength	1.00
		Low strength	0.50	Slope	0.50		
				Low strength	0.50		
30D:							
Macove--------	85	Severe		Poorly suited		Severe	
		Stoniness	1.00	Rock fragments	1.00	Low strength	1.00
		Slope	0.50	Slope	1.00		
		Low strength	0.50	Low strength	0.50		
30E:							
Macove--------	85	Severe		Poorly suited		Severe	
		Slope	1.00	Rock fragments	1.00	Low strength	1.00
		Stoniness	1.00	Slope	1.00		
		Low strength	0.50	Low strength	0.50		
31C:							
Macove--------	75	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
31D:							
Macove--------	75	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
31E:							
Macove--------	75	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
32A:							
Maurertown----	80	Severe		Poorly suited		Severe	
		Wetness	1.00	Ponding	1.00	Low strength	1.00
		Low strength	0.50	Wetness	0.50		
				Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
33A:							
Mongle--------	80	Severe		Moderately suited		Severe	
		Wetness	1.00	Low strength	0.50	Low strength	1.00
		Low strength	0.50				
34B:							
Monongahela---	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
34C:							
Monongahela---	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
35C:							
Pigeonroost---	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
35D:							
Pigeonroost---	80	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
35E:							
Pigeonroost---	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
36F:							
Rock outcrop--	40	Not rated		Not rated		Not rated	
Opequon-------	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
37B:							
Shottower-----	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
37C:							
Shottower-----	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
37D:							
Shottower-----	85	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
38A:							
Sindion-------	85	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
39A:							
Speedwell-----	85	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
40B:							
Tate----------	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
40C:							
Tate----------	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
40D:							
Tate----------	80	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
41B:							
Timberville---	45	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Marbie--------	35	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
42C:							
Timberville---	45	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Marbie--------	35	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
43B:							
Tumbling------	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Rock fragments	0.50	Low strength	1.00
				Low strength	0.50		
43C:							
Tumbling------	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Rock fragments	0.50		
				Low strength	0.50		
43D:							
Tumbling------	85	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Rock fragments	0.50		
				Low strength	0.50		
44B:							
Tumbling------	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
44C:							
Tumbling------	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
44D:							
Tumbling------	85	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
44E:							
Tumbling------	85	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
45:							
Udorthents----	70	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00		
46:							
Udorthents----	95	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00		
47:							
Udorthents----	40	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00		
Urban land----	35	Not rated		Not rated		Not rated	
48:							
Urban land----	85	Not rated		Not rated		Not rated	
49C:							
Watahala------	85	Slight		Moderately suited		Slight	
				Slope	0.50	Strength	0.10
49D:							
Watahala------	85	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
49E:							
Watahala------	85	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Low strength	0.50				
50D:							
Weikert-------	85	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50				
50E, 50F:							
Weikert-------	85	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
51C:							
Westmoreland--	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
51D:							
Westmoreland--	85	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
		Sandiness	0.50				

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
51E, 51F:							
Westmoreland--	85	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
52D:							
Westmoreland--	45	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Restrictive layer	0.50	Low strength	0.50		
		Low strength	0.50				
Rock outcrop--	30	Not rated		Not rated		Not rated	
52E, 52F:							
Westmoreland--	45	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Rock outcrop--	30	Not rated		Not rated		Not rated	
53B:							
Wheeling------	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
54A:							
Wolfgap-------	85	Severe		Poorly suited		Moderate	
		Flooding	1.00	Flooding	1.00	Low strength	0.50
55B:							
Wyrick--------	50	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Marbie--------	30	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
55C:							
Wyrick--------	50	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Marbie--------	30	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
55D:							
Wyrick--------	50	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Marbie--------	30	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
1B:							
Allegheny	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
1C:							
Allegheny	85	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
2A:							
Atkins	75	Slight		Slight		Poorly suited	
						Ponding	1.00
						Flooding	1.00
						Wetness	0.50
3D:							
Berks	75	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
3E:							
Berks	75	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
3F:							
Berks	75	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
4D:							
Bland	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
4E:							
Bland	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
5B:							
Botetourt	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
6D:							
Calvin	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
6E:							
Calvin	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
6F:							
Calvin--------	80	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
7A:							
Clubcaf-------	85	Slight		Slight		Poorly suited	
						Ponding	1.00
						Flooding	1.00
						Low strength	0.50
8D:							
Dekalb--------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
8E:							
Dekalb--------	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
9F:							
Drypond-------	45	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
Rock outcrop--	30	Not rated		Not rated		Not rated	
10F:							
Drypond-------	75	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
11B:							
Ebbing--------	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
12C:							
Edneytown-----	85	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
12D:							
Edneytown-----	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
12E:							
Edneytown-----	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
13C:							
Elliber-------	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
13D:							
Elliber-------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
13E:							
Elliber-------	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
14B:							
Ernest--------	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
14C:							
Ernest--------	85	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
15C:							
Faywood-------	85	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
15D:							
Faywood-------	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
15E:							
Faywood-------	85	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
16B:							
Frederick-----	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
16C:							
Frederick-----	80	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
16D, 16E:							
Frederick-----	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
17C:							
Frederick-----	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
17D:							
Frederick-----	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
17E:							
Fredrick------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
18D:							
Greenlee------	85	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Rock fragments	0.50
19C:							
Hagerstown----	45	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
19E:							
Hagerstown----	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown----	80	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
20D:							
Hagerstown----	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
20E:							
Hagerstown----	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
21D:							
Hagerstown----	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
22C:							
Hagerstown----	80	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
22D:							
Hagerstown----	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
23C:							
Hayter--------	75	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
23D:							
Hayter--------	70	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
24B:							
Ingledove-----	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
25C:							
Konnarock-----	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
25D:							
Konnarock-----	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
25E:							
Konnarock-----	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
26B:							
Lily----------	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
26C:							
Lily----------	80	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
26D:							
Lily----------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
26E:							
Lily----------	80	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
27D:							
Litz----------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
27E:							
Litz----------	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
27F:							
Litz----------	65	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
28C:							
Litz----------	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
Groseclose----	30	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
28D:							
Litz----------	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Groseclose----	30	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
28E:							
Litz----------	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
Groseclose----	30	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
29A:							
Lobdell-------	75	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
30C:							
Macove--------	85	Slight		Severe		Poorly suited	
				Slope/erodibility	0.95	Rock fragments	1.00
						Slope	0.50
						Low strength	0.50
30D:							
Macove--------	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Rock fragments	1.00
						Slope	1.00
						Low strength	0.50
30E:							
Macove--------	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Rock fragments	1.00
						Slope	1.00
						Low strength	0.50
31C:							
Macove--------	75	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
31D:							
Macove--------	75	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
31E:							
Macove--------	75	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
32A:							
Maurertown----	80	Slight		Slight		Poorly suited	
						Ponding	1.00
						Wetness	0.50
						Low strength	0.50
33A:							
Mongle--------	80	Slight		Slight		Moderately suited	
						Low strength	0.50
34B:							
Monongahela---	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
34C:							
Monongahela---	85	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
35C:							
Pigeonroost---	80	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
35D:							
Pigeonroost---	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
35E:							
Pigeonroost---	80	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
36F:							
Rock outcrop--	40	Not rated		Not rated		Not rated	
Opequon-------	30	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
37B:							
Shottower-----	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
37C:							
Shottower-----	85	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
37D:							
Shottower-----	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
38A:							
Sindion-------	85	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
39A:							
Speedwell-----	85	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
40B:							
Tate----------	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
40C:							
Tate----------	80	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
40D:							
Tate----------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
41B:							
Timberville---	45	Slight		Moderate		Poorly suited	
				Slope/erodibility	0.50	Flooding	1.00
						Low strength	0.50

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
41B:							
Marbie	35	Slight		Moderate		Poorly suited	
				Slope/erodibility	0.50	Flooding	1.00
						Low strength	0.50
42C:							
Timberville	45	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
Marbie	35	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
43B:							
Tumbling	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Rock fragments	0.50
						Low strength	0.50
43C:							
Tumbling	85	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Rock fragments	0.50
						Low strength	0.50
43D:							
Tumbling	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Low strength	0.50
44B:							
Tumbling	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
44C:							
Tumbling	85	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
44D, 44E:							
Tumbling	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
45:							
Udorthents	70	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
46:							
Udorthents	95	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
47:							
Udorthents	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Urban land	35	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
48:							
Urban land	85	Not rated		Not rated		Not rated	
49C:							
Watahala	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
49D, 49E:							
Watahala	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
50D:							
Weikert	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
50E:							
Weikert	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
50F:							
Weikert	85	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
51C:							
Westmoreland	85	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
51D:							
Westmoreland	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
51E:							
Westmoreland	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
51F:							
Westmoreland	85	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
52D:							
Westmoreland	45	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	
52E:							
Westmoreland	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
52F:							
Westmoreland--	45	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
53B:							
Wheeling------	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
54A:							
Wolfgap-------	85	Slight		Slight		Poorly suited	
						Flooding	1.00
55B:							
Wyrick--------	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
Marbie--------	30	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
55C:							
Wyrick--------	50	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
Marbie--------	30	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
55D:							
Wyrick--------	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Marbie--------	30	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part III

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
1B, 1C:							
Allegheny-----	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
				Rock fragments	0.50		
2A:							
Atkins--------	75	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Wetness	1.00
						Low strength	0.50
3D:							
Berks---------	75	Moderately suited		Poorly suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.75		
				Slope	0.50		
3E, 3F:							
Berks---------	75	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75		
4D:							
Bland---------	85	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.75	Slope	0.50
4E:							
Bland---------	85	Poorly suited		Unsuited		Poorly suited	
		Stickiness; high plasticity index	0.75	Slope	1.00	Slope	1.00
		Slope	0.50	Stickiness; high plasticity index	0.75	Low strength	0.50
5B:							
Botetourt-----	80	Well suited		Well suited		Moderately suited	
						Low strength	0.50
6D:							
Calvin--------	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
				Rock fragments	0.50		
6E:							
Calvin--------	80	Moderately suited		Unsuited		Moderately suited	
		Slope	0.50	Slope	1.00	Slope	0.50
				Rock fragments	0.50	Low strength	0.50
6F:							
Calvin--------	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	0.50

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
7A:							
Clubcaf-------	85	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Wetness	1.00
						Low strength	0.50
8D:							
Dekalb--------	80	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
8E:							
Dekalb--------	85	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
9F:							
Drypond-------	45	Poorly suited		Unsuited		Poorly suited	
		Rock fragments	0.75	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	1.00		
Rock outcrop--	30	Not rated		Not rated		Not rated	
10F:							
Drypond-------	75	Poorly suited		Unsuited		Poorly suited	
		Rock fragments	0.75	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	1.00		
11B:							
Ebbing--------	90	Well suited		Well suited		Moderately suited	
						Low strength	0.50
12C:							
Edneytown-----	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
12D:							
Edneytown-----	85	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
12E:							
Edneytown-----	85	Well suited		Unsuited		Moderately suited	
				Slope	1.00	Low strength	0.50
						Slope	0.50
13C:							
Elliber-------	80	Moderately suited		Poorly suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.75		
				Slope	0.50		
13D:							
Elliber-------	80	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Rock fragments	0.75	Slope	0.50
				Slope	0.75		
13E:							
Elliber-------	80	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
14B, 14C:							
Ernest--------	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
15C:							
Faywood-------	85	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
15D:							
Faywood-------	85	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
15E:							
Faywood-------	85	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
16B:							
Frederick-----	85	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
16C:							
Frederick-----	80	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
16D:							
Frederick-----	80	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
16E:							
Frederick-----	80	Moderately suited		Unsuited		Moderately suited	
		Slope	0.50	Slope	1.00	Slope	0.50
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
17C:							
Frederick-----	85	Moderately suited		Poorly suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.75		
		Stickiness; high plasticity index	0.50	Slope	0.50		
				Stickiness; high plasticity index	0.50		
17D:							
Frederick-----	85	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Rock fragments	0.75	Slope	0.50
		Stickiness; high plasticity index	0.50	Slope	0.75		
				Stickiness; high plasticity index	0.50		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
17E:							
Frederick-----	80	Moderately suited		Unsuited		Moderately suited	
		Rock fragments	0.50	Slope	1.00	Slope	0.50
		Slope	0.50	Rock fragments	0.75		
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
18D:							
Greenlee------	85	Poorly suited		Unsuited		Moderately suited	
		Rock fragments	0.75	Rock fragments	1.00	Rock fragments	0.50
				Slope	0.75	Slope	0.50
19C:							
Hagerstown----	45	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
Rock outcrop--	30	Not rated		Not rated		Not rated	
19E:							
Hagerstown----	45	Moderately suited		Unsuited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	1.00	Slope	0.50
				Stickiness; high plasticity index	0.50	Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown----	80	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
20D:							
Hagerstown----	80	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
20E:							
Hagerstown----	80	Moderately suited		Unsuited		Moderately suited	
		Slope	0.50	Slope	1.00	Slope	0.50
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
21D:							
Hagerstown----	45	Moderately suited		Unsuited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	1.00	Slope	0.50
				Stickiness; high plasticity index	0.50	Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
22C:							
Hagerstown----	80	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
22D:							
Hagerstown----	80	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
23C:							
Hayter--------	75	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
23D:							
Hayter--------	70	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
24B:							
Ingledove-----	80	Well suited		Moderately suited		Moderately suited	
				Rock fragments	0.50	Low strength	0.50
25C:							
Konnarock-----	80	Moderately suited		Poorly suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.75		
				Slope	0.50		
25D:							
Konnarock-----	80	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Rock fragments	0.75	Slope	0.50
				Slope	0.75		
25E:							
Konnarock-----	80	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		
26B, 26C:							
Lily----------	80	Well suited		Moderately suited		Moderately suited	
				Rock fragments	0.50	Low strength	0.50
				Slope	0.50		
26D:							
Lily----------	80	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
				Rock fragments	0.50	Slope	0.50
26E:							
Lily----------	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	0.50
27D:							
Litz----------	80	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Rock fragments	0.75	Slope	0.50
				Slope	0.75		
27E:							
Litz----------	80	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
27F:							
Litz----------	65	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		
28C:							
Litz----------	50	Moderately suited		Poorly suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.75		
				Slope	0.50		
Groseclose----	30	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
28D:							
Litz----------	50	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Rock fragments	0.75	Slope	0.50
				Slope	0.75		
Groseclose----	30	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
28E:							
Litz----------	45	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		
Groseclose----	30	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
29A:							
Lobdell-------	75	Well suited		Well suited		Moderately suited	
						Low strength	0.50
30C:							
Macove--------	85	Poorly suited		Unsuited		Poorly suited	
		Rock fragments	0.75	Rock fragments	1.00	Rock fragments	1.00
				Slope	0.50	Low strength	0.50
30D:							
Macove--------	85	Poorly suited		Unsuited		Poorly suited	
		Rock fragments	0.75	Rock fragments	1.00	Rock fragments	1.00
				Slope	0.75	Low strength	0.50
						Slope	0.50
30E:							
Macove--------	85	Poorly suited		Unsuited		Poorly suited	
		Rock fragments	0.75	Slope	1.00	Rock fragments	1.00
		Slope	0.50	Rock fragments	1.00	Slope	1.00
						Low strength	0.50
31C:							
Macove--------	75	Moderately suited		Poorly suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.75		
				Slope	0.50		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
31D:							
Macove--------	75	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.75		
31E:							
Macove--------	75	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		
32A:							
Maurertown----	80	Moderately suited		Moderately suited		Poorly suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Wetness	1.00
						Low strength	0.50
33A:							
Mongle--------	80	Well suited		Well suited		Poorly suited	
						Wetness	1.00
						Low strength	0.50
34B, 34C:							
Monongahela---	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
35C:							
Pigeonroost---	80	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
35D:							
Pigeonroost---	80	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
35E:							
Pigeonroost---	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
36F:							
Rock outcrop--	40	Not rated		Not rated		Not rated	
Opequon-------	30	Poorly suited		Unsuited		Poorly suited	
		Slope	0.75	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Rock fragments	0.50		
37B:							
Shottower-----	85	Well suited		Well suited		Moderately suited	
						Low strength	0.50
37C:							
Shottower-----	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
37D:							
Shottower-----	85	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
38A:							
Sindion-------	85	Well suited		Well suited		Moderately suited	
						Low strength	0.50
39A:							
Speedwell-----	85	Well suited		Well suited		Moderately suited	
						Low strength	0.50
40B, 40C:							
Tate----------	80	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
40D:							
Tate----------	80	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
41B:							
Timberville---	45	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
Marbie--------	35	Well suited		Well suited		Moderately suited	
						Low strength	0.50
42C:							
Timberville---	45	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
Marbie--------	35	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
43B:							
Tumbling------	85	Well suited		Moderately suited		Moderately suited	
				Rock fragments	0.50	Rock fragments	0.50
						Low strength	0.50
43C:							
Tumbling------	85	Well suited		Moderately suited		Moderately suited	
				Rock fragments	0.50	Rock fragments	0.50
				Slope	0.50	Low strength	0.50
43D:							
Tumbling------	85	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Rock fragments	0.50
				Rock fragments	0.50	Low strength	0.50
						Slope	0.50
44B:							
Tumbling------	85	Well suited		Well suited		Moderately suited	
						Low strength	0.50
44C:							
Tumbling------	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
44D:							
Tumbling------	85	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
44E:							
Tumbling------	85	Moderately suited		Unsuited		Moderately suited	
		Slope	0.50	Slope	1.00	Slope	0.50
						Low strength	0.50
45:							
Udorthents----	70	Well suited		Moderately suited		Well suited	
				Slope	0.50		
46:							
Udorthents----	95	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
47:							
Udorthents----	40	Well suited		Moderately suited		Well suited	
				Slope	0.50		
Urban land----	35	Not rated		Not rated		Not rated	
48:							
Urban land----	85	Not rated		Not rated		Not rated	
49C:							
Watahala------	85	Moderately suited		Moderately suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.50		
				Slope	0.50		
49D:							
Watahala------	85	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.50		
49E:							
Watahala------	85	Moderately suited		Unsuited		Moderately suited	
		Rock fragments	0.50	Slope	1.00	Slope	0.50
		Slope	0.50	Rock fragments	0.50		
50D:							
Weikert-------	85	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.75		
50E:							
Weikert-------	85	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		
50F:							
Weikert-------	85	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75		
51C:							
Westmoreland--	85	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
51D:							
Westmoreland--	85	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
51E, 51F:							
Westmoreland--	85	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
52D:							
Westmoreland--	45	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
52E, 52F:							
Westmoreland--	45	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
Rock outcrop--	30	Not rated		Not rated		Not rated	
53B:							
Wheeling------	80	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
54A:							
Wolfgap-------	85	Well suited		Well suited		Well suited	
55B, 55C:							
Wyrick--------	50	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
Marbie--------	30	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
55D:							
Wyrick--------	50	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
Marbie--------	30	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part IV

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
1B, 1C:					
Allegheny	85	Well suited		Well suited	
2A:					
Atkins	75	Unsuited		Unsuited	
		Wetness	0.75	Wetness	1.00
3D:					
Berks	75	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
3E, 3F:					
Berks	75	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
4D:					
Bland	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
4E:					
Bland	85	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Restrictive layer	0.50
5B:					
Botetourt	80	Well suited		Well suited	
6D:					
Calvin	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50
6E:					
Calvin	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50
6F:					
Calvin	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	0.50
7A:					
Clubcaf	85	Unsuited		Unsuited	
		Wetness	0.75	Wetness	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
8D:					
Dekalb	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50
8E:					
Dekalb	85	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	0.50
9F:					
Drypond	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
Rock outcrop	30	Not rated		Not rated	
10F:					
Drypond	75	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
11B:					
Ebbing	90	Well suited		Well suited	
12C:					
Edneytown	85	Well suited		Well suited	
12D, 12E:					
Edneytown	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
13C:					
Elliber	80	Poorly suited		Well suited	
		Rock fragments	0.50		
13D:					
Elliber	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
13E:					
Elliber	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
14B, 14C:					
Ernest	85	Well suited		Well suited	
15C:					
Faywood	85	Well suited		Poorly suited	
				Restrictive layer	0.50
15D:					
Faywood	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
15E:					
Faywood-------------	85	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	0.50
16B:					
Frederick-----------	85	Well suited		Well suited	
16C:					
Frederick-----------	80	Well suited		Well suited	
16D, 16E:					
Frederick-----------	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
17C:					
Frederick-----------	85	Poorly suited		Well suited	
		Rock fragments	0.50		
17D:					
Frederick-----------	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
17E:					
Frederick-----------	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
18D:					
Greenlee------------	85	Poorly suited		Poorly suited	
		Rock fragments	0.50	Slope	0.50
		Slope	0.50	Rock fragments	0.50
19C:					
Hagerstown----------	45	Well suited		Well suited	
Rock outcrop--------	30	Not rated		Not rated	
19E:					
Hagerstown----------	45	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Rock outcrop--------	30	Not rated		Not rated	
20C:					
Hagerstown----------	80	Well suited		Well suited	
20D, 20E:					
Hagerstown----------	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
21D:					
Hagerstown----------	45	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Rock outcrop--------	30	Not rated		Not rated	

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
22C:					
Hagerstown	80	Well suited		Well suited	
22D:					
Hagerstown	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
23C:					
Hayter	75	Well suited		Well suited	
23D:					
Hayter	70	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
24B:					
Ingledove	80	Well suited		Well suited	
25C:					
Konnarock	80	Poorly suited		Poorly suited	
		Rock fragments	0.50	Restrictive layer	0.50
25D:					
Konnarock	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Restrictive layer	0.50
25E:					
Konnarock	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	0.50
26B, 26C:					
Lily	80	Well suited		Poorly suited	
				Restrictive layer	0.50
26D:					
Lily	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50
26E:					
Lily	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	0.50
27D:					
Litz	80	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
27E:					
Litz	80	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
27F:					
Litz	65	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
28C:					
Litz	50	Poorly suited		Unsuited	
		Rock fragments	0.50	Restrictive layer	1.00
Groseclose	30	Well suited		Well suited	
28D:					
Litz	50	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
Groseclose	30	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
28E:					
Litz	45	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
Groseclose	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
29A:					
Lobdell	75	Well suited		Well suited	
30C:					
Macove	85	Unsuited		Unsuited	
		Rock fragments	1.00	Rock fragments	1.00
30D:					
Macove	85	Unsuited		Unsuited	
		Rock fragments	1.00	Rock fragments	1.00
		Slope	0.50	Slope	0.50
30E:					
Macove	85	Unsuited		Unsuited	
		Rock fragments	1.00	Slope	1.00
		Slope	1.00	Rock fragments	1.00
31C:					
Macove	75	Poorly suited		Well suited	
		Rock fragments	0.50		
31D:					
Macove	75	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
31E:					
Macove	75	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
32A:					
Maurertown	80	Well suited		Unsuited	
				Wetness	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
33A:					
Mongle	80	Well suited		Unsuited	
				Wetness	1.00
34B, 34C:					
Monongahela	85	Well suited		Well suited	
35C:					
Pigeonroost	80	Well suited		Well suited	
35D:					
Pigeonroost	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
35E:					
Pigeonroost	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
36F:					
Rock outcrop	40	Not rated		Not rated	
Opequon	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Restrictive layer	1.00
37B, 37C:					
Shottower	85	Well suited		Well suited	
37D:					
Shottower	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
38A:					
Sindion	85	Well suited		Well suited	
39A:					
Speedwell	85	Well suited		Well suited	
40B, 40C:					
Tate	80	Well suited		Well suited	
40D:					
Tate	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
41B, 42C:					
Timberville	45	Well suited		Well suited	
Marbie	35	Well suited		Well suited	
43B, 43C:					
Tumbling	85	Poorly suited		Well suited	
		Rock fragments	0.50		
43D:					
Tumbling	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
44B, 44C:					
Tumbling	85	Well suited		Well suited	
44D, 44E:					
Tumbling	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
45:					
Udorthents	70	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
46:					
Udorthents	95	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
47:					
Udorthents	40	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Urban land	35	Not rated		Not rated	
48:					
Urban land	85	Not rated		Not rated	
49C:					
Watahala	85	Poorly suited		Well suited	
		Rock fragments	0.50		
49D, 49E:					
Watahala	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
50D:					
Weikert	85	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
50E:					
Weikert	85	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
50F:					
Weikert	85	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
51C:					
Westmoreland	85	Well suited		Well suited	
51D:					
Westmoreland	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
51E, 51F:					
Westmoreland	85	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
52D:					
Westmoreland--------	45	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Rock outcrop--------	30	Not rated		Not rated	
52E, 52F:					
Westmoreland--------	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Rock outcrop--------	30	Not rated		Not rated	
53B:					
Wheeling------------	80	Well suited		Well suited	
54A:					
Wolfgap-------------	85	Well suited		Well suited	
55B, 55C:					
Wyrick--------------	50	Well suited		Well suited	
Marbie--------------	30	Well suited		Well suited	
55D:					
Wyrick--------------	50	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Marbie--------------	30	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
W:					
Water---------------	100	Not rated		Not rated	

Table 10.—Forestland Management, Part V

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
1B, 1C:					
Allegheny	85	Moderate		Low	
		Texture/rock fragments	0.50		
2A:					
Atkins	75	Low		High	
		Texture/surface depth/rock fragments	0.10	Wetness	1.00
3D:					
Berks	75	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
3E, 3F:					
Berks	75	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
4D:					
Bland	85	Moderate		Low	
		Texture/rock fragments	0.50		
4E:					
Bland	85	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
5B:					
Botetourt	80	Low		Low	
		Texture/rock fragments	0.10		
6D:					
Calvin	85	Moderate		Low	
		Texture/rock fragments	0.50		
6E, 6F:					
Calvin	80	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
7A:					
Clubcaf	85	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
8D:					
Dekalb	80	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
8E:					
Dekalb	85	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
9F:					
Drypond	45	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Soil reaction	0.50
Rock outcrop	30	Not rated		Not rated	
10F:					
Drypond	75	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Soil reaction	0.50
11B:					
Ebbing	90	Low		Low	
		Texture/rock fragments	0.10		
12C, 12D:					
Edneytown	85	Low		Low	
		Texture/surface depth/rock fragments	0.10		
12E:					
Edneytown	85	Moderate		Low	
		Texture/slope/ surface depth/ rock fragments	0.50		
13C, 13D:					
Elliber	80	Moderate		Moderate	
		Texture/rock fragments	0.50	Soil reaction	0.50
13E:					
Elliber	80	High		Moderate	
		Texture/slope/ rock fragments	1.00	Soil reaction	0.50
14B, 14C:					
Ernest	85	Low		Low	
		Texture/rock fragments	0.10		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
15C, 15D:					
Faywood	85	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
15E:					
Faywood	85	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
16B:					
Frederick	85	Moderate		Low	
		Texture/rock fragments	0.50		
16C, 16D, 16E:					
Frederick	80	Moderate		Low	
		Texture/rock fragments	0.50		
17C, 17D:					
Frederick	85	Moderate		Low	
		Texture/rock fragments	0.50		
17E:					
Frederick	80	Moderate		Low	
		Texture/rock fragments	0.50		
18D:					
Greenlee	85	Low		Low	
		Texture/rock fragments	0.10		
19C, 19E:					
Hagerstown	45	Moderate		Low	
		Texture/rock fragments	0.50		
Rock outcrop	30	Not rated		Not rated	
20C, 20D, 20E:					
Hagerstown	80	Moderate		Low	
		Texture/rock fragments	0.50		
21D:					
Hagerstown	45	Moderate		Low	
		Texture/rock fragments	0.50		
Rock outcrop	30	Not rated		Not rated	
22C, 22D:					
Hagerstown	80	Moderate		Low	
		Texture/rock fragments	0.50		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
23C:					
Hayter	75	Low		Low	
		Texture/rock fragments	0.10		
23D:					
Hayter	70	Low		Low	
		Texture/rock fragments	0.10		
24B:					
Ingledove	80	Low		Low	
		Texture/rock fragments	0.10		
25C, 25D:					
Konnarock	80	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
25E:					
Konnarock	80	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
26B, 26C, 26D:					
Lily	80	Moderate		Moderate	
		Texture/rock fragments	0.50	Soil reaction	0.50
26E:					
Lily	80	Moderate		Moderate	
		Texture/slope/ rock fragments	0.50	Soil reaction	0.50
27D:					
Litz	80	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
27E:					
Litz	80	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
27F:					
Litz	65	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
28C, 28D:					
Litz	50	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Groseclose	30	Moderate		Low	
		Texture/rock fragments	0.50		
28E:					
Litz	45	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
Groseclose	30	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
29A:					
Lobdell	75	Low		Low	
		Texture/rock fragments	0.10		
30C, 30D:					
Macove	85	Moderate		Low	
		Texture/rock fragments	0.50		
30E:					
Macove	85	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
31C, 31D:					
Macove	75	Moderate		Low	
		Texture/rock fragments	0.50		
31E:					
Macove	75	High		Low	
		Texture/slope/ rock fragments	1.00		
32A:					
Maurertown	80	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
33A:					
Mongle	80	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
34B, 34C:					
Monongahela	85	Moderate		Low	
		Texture/rock fragments	0.50		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
35C, 35D, 35E:					
Pigeonroost	80	Low		Low	
		Texture/rock fragments	0.10		
36F:					
Rock outcrop	40	Not rated		Not rated	
Opequon	30	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
37B, 37C, 37D:					
Shottower	85	Moderate		Low	
		Texture/rock fragments	0.50		
38A:					
Sindion	85	Low		Low	
		Texture/rock fragments	0.10		
39A:					
Speedwell	85	Low		Low	
		Texture/rock fragments	0.10		
40B, 40C, 40D:					
Tate	80	Low		Low	
		Texture/rock fragments	0.10		
41B, 42C:					
Timberville	45	Low		Low	
		Texture/rock fragments	0.10		
Marbie	35	Moderate		Low	
		Texture/rock fragments	0.50		
43B, 43C, 43D, 44B, 44C, 44D:					
Tumbling	85	Low		Low	
		Texture/rock fragments	0.10		
44E:					
Tumbling	85	Low		Low	
		Texture/slope/ rock fragments	0.10		
45:					
Udorthents	70	Low		High	
				Soil reaction	1.00
				Available water	0.50
46:					
Udorthents	95	Low		High	
				Soil reaction	1.00

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
47:					
Udorthents	40	Low		High	
				Soil reaction	1.00
				Available water	0.50
Urban land	35	Not rated		Not rated	
48:					
Urban land	85	Not rated		Not rated	
49C, 49D:					
Watahala	85	Moderate		Low	
		Texture/rock fragments	0.50		
49E:					
Watahala	85	High		Low	
		Texture/slope/ rock fragments	1.00		
50D:					
Weikert	85	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
50E, 50F:					
Weikert	85	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
51C, 51D:					
Westmoreland	85	Moderate		Low	
		Texture/rock fragments	0.50		
51E, 51F:					
Westmoreland	85	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
52D:					
Westmoreland	45	Moderate		Low	
		Texture/rock fragments	0.50		
Rock outcrop	30	Not rated		Not rated	
52E, 52F:					
Westmoreland	45	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
Rock outcrop	30	Not rated		Not rated	
53B:					
Wheeling	80	Low		Low	
		Texture/rock fragments	0.10		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
54A:					
Wolfgap	85	Low		Low	
		Texture/rock fragments	0.10		
55B, 55C, 55D:					
Wyrick	50	Moderate		Low	
		Texture/rock fragments	0.50		
Marbie	30	Moderate		Low	
		Texture/rock fragments	0.50		
W:					
Water	100	Not rated		Not rated	

Table 11.—Recreational Development, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1B:							
Allegheny------	85	Not limited		Not limited		Somewhat limited	
						Slope	0.88
1C:							
Allegheny------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
2A:							
Atkins---------	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Ponding	1.00	Flooding	0.40	Ponding	1.00
3D, 3E, 3F:							
Berks----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.78
						Depth to bedrock	0.06
4D, 4E:							
Bland----------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.26	Restricted permeability	0.26	Depth to bedrock	0.90
						Restricted permeability	0.26
5B:							
Botetourt------	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.98
		Depth to saturated zone	0.98			Slope	0.12
6D:							
Calvin---------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
6E, 6F:							
Calvin---------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.54
7A:							
Clubcaf--------	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Ponding	1.00	Flooding	0.40	Ponding	1.00

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
8D:							
Dekalb	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	0.26	Gravel content	0.26	Slope	1.00
						Depth to bedrock	0.54
8E:							
Dekalb	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	0.26	Gravel content	0.26	Slope	1.00
						Depth to bedrock	0.54
9F:							
Drypond	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	0.32	Gravel content	0.32	Gravel content	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
10F:							
Drypond	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	0.32	Gravel content	0.32	Gravel content	1.00
11B:							
Ebbing	90	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.98
		Depth to saturated zone	0.98			Slope	0.12
12C:							
Edneytown	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
12D, 12E:							
Edneytown	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
13C:							
Elliber	80	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
13D, 13E:							
Elliber	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
14B:							
Ernest	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
		Depth to cemented pan	0.46	Depth to cemented pan	0.46	Slope	0.88
						Depth to cemented pan	0.46

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
14C:							
Ernest	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75	Slope	1.00
		Depth to cemented pan	0.46	Depth to cemented pan	0.46	Depth to saturated zone	0.98
		Slope	0.37	Slope	0.37	Depth to cemented pan	0.46
15C:							
Faywood	85	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.50	Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Depth to bedrock	0.65
						Restricted permeability	0.50
15D, 15E:							
Faywood	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Restricted permeability	0.50	Depth to bedrock	0.65
						Restricted permeability	0.50
16B:							
Frederick	85	Not limited		Not limited		Somewhat limited	
						Slope	0.88
16C:							
Frederick	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
16D, 16E:							
Frederick	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
17C:							
Frederick	85	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
17D:							
Frederick	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
17E:							
Frederick	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
18D:							
Greenlee	85	Very limited		Very limited		Very limited	
		Too stony	1.00	Too stony	1.00	Content of large stones	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.20	Content of large stones	0.20	Too stony	1.00
19C:							
Hagerstown	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
19E:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop---	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown-----	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
20D, 20E:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
21D:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop---	30	Not rated		Not rated		Not rated	
22C:							
Hagerstown-----	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
22D:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
23C:							
Hayter---------	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
23D:							
Hayter---------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
24B:							
Ingledove------	80	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Slope	0.12
						Content of large stones	0.03
25C:							
Konnatock------	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
		Gravel content	0.26	Gravel content	0.26	Gravel content	1.00
						Depth to bedrock	0.95
25D, 25E:							
Konnarock------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.26	Gravel content	0.26	Gravel content	1.00
						Depth to bedrock	0.95
26B:							
Lily-----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too stony	0.94	Too stony	0.94	Too stony	0.94
						Depth to bedrock	0.90
						Slope	0.88

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
26C:							
Lily-----------	80	Somewhat limited		Somewhat limited		Very limited	
		Too stony	0.94	Too stony	0.94	Slope	1.00
		Slope	0.37	Slope	0.37	Too stony	0.94
						Depth to bedrock	0.90
26D, 26E:							
Lily-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too stony	0.94	Too stony	0.94	Too stony	0.94
						Depth to bedrock	0.90
27D, 27E:							
Litz-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
						Depth to bedrock	0.10
27F:							
Litz-----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
						Depth to bedrock	0.10
28C:							
Litz-----------	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
						Gravel content	0.56
						Depth to bedrock	0.10
Groseclose-----	30	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
		Slope	0.63	Slope	0.63	Restricted permeability	0.96
28D:							
Litz-----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
						Depth to bedrock	0.10
Groseclose-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
28E:							
Litz-----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.56
						Depth to bedrock	0.10
Groseclose-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
29A:							
Lobdell----------	75	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.19	Flooding	0.60
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
30C:							
Macove-----------	85	Very limited		Very limited		Very limited	
		Too stony	1.00	Too stony	1.00	Slope	1.00
		Slope	0.37	Slope	0.37	Too stony	1.00
						Content of large stones	0.92
30D, 30E:							
Macove-----------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too stony	1.00	Too stony	1.00	Too stony	1.00
						Content of large stones	0.92
31C:							
Macove-----------	75	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
						Content of large stones	0.01
31D, 31E:							
Macove-----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
						Content of large stones	0.01
32A:							
Maurertown-------	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Restricted permeability	1.00	Restricted permeability	1.00
33A:							
Mongle-----------	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00				
34B:							
Monongahela------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
		Depth to cemented pan	0.71	Depth to cemented pan	0.71	Slope	0.88
						Depth to cemented pan	0.71

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
34C:							
Monongahela----	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.75	Slope	1.00
		Depth to cemented pan	0.71	Depth to cemented pan	0.71	Depth to saturated zone	0.98
		Slope	0.37	Slope	0.37	Depth to cemented pan	0.71
35C:							
Pigeonroost----	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.06
35D, 35E:							
Pigeonroost----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.06
36F:							
Rock outcrop---	40	Not rated		Not rated		Not rated	
Opequon--------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel content	0.56
37B:							
Shottower------	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
37C:							
Shottower------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
37D:							
Shottower------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
38A:							
Sindion--------	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.98
		Depth to saturated zone	0.98			Flooding	0.60
39A:							
Speedwell------	85	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
40B:							
Tate-----------	80	Not limited		Not limited		Somewhat limited	
						Slope	0.88
40C:							
Tate-----------	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
40D:							
Tate-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
41B:							
Timberville----	45	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
						Slope	0.88
Marbie---------	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to cemented pan	1.00	Flooding	0.40	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
42C:							
Timberville----	45	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Slope	0.16	Slope	1.00
		Slope	0.16				
Marbie---------	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to cemented pan	1.00	Slope	1.00
		Depth to cemented pan	1.00	Depth to saturated zone	0.19	Depth to cemented pan	1.00
		Depth to saturated zone	0.39	Slope	0.16	Depth to saturated zone	0.39
43B:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too stony	0.76	Too stony	0.76	Too stony	0.76
						Slope	0.50
43C:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Very limited	
		Too stony	0.76	Too stony	0.76	Slope	1.00
		Slope	0.37	Slope	0.37	Too stony	0.76
43D:							
Tumbling-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too stony	0.76	Too stony	0.76	Too stony	0.76
44B:							
Tumbling-------	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
44C:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
44D, 44E:							
Tumbling-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
45:							
Udorthents-----	70	Not rated		Not rated		Not rated	
46:							
Udorthents-----	95	Not rated		Not rated		Not rated	
47:							
Udorthents-----	40	Not rated		Not rated		Not rated	
Urban land-----	35	Not rated		Not rated		Not rated	

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
48:							
Urban land	85	Not rated		Not rated		Not rated	
49C:							
Watahala	85	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
						Content of large stones	0.01
49D, 49E:							
Watahala	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
						Content of large stones	0.01
50D, 50E, 50F:							
Weikert	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel content	0.56
51C:							
Westmoreland	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
51D, 51E, 51F:							
Westmoreland	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
52D, 52E, 52F:							
Westmoreland	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
53B:							
Wheeling	80	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Slope	0.88
54A:							
Wolfgap	85	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
55B:							
Wyrick	50	Not limited		Not limited		Somewhat limited	
						Slope	0.88
Marbie	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Slope	0.88
						Depth to saturated zone	0.39

Table 11.—Recreational Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
55C:							
Wyrick	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
Marbie	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Slope	1.00
		Depth to saturated zone	0.39	Slope	0.37	Depth to cemented pan	1.00
		Slope	0.37	Depth to saturated zone	0.19	Depth to saturated zone	0.39
55D:							
Wyrick	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Marbie	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
W:							
Water	100	Not rated		Not rated		Not rated	

Table 11.—Recreational Development, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1B:							
Allegheny	85	Not limited		Not limited		Not limited	
1C:							
Allegheny	85	Not limited		Not limited		Somewhat limited	
						Slope	0.16
2A:							
Atkins	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
3D:							
Berks	75	Not limited		Not limited		Very limited	
						Slope	1.00
						Droughty	0.99
						Depth to bedrock	0.06
3E, 3F:							
Berks	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.99
						Depth to bedrock	0.06
4D:							
Bland	85	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50			Depth to bedrock	0.90
						Droughty	0.16
4E:							
Bland	85	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	0.96	Depth to bedrock	0.90
						Droughty	0.16
5B:							
Botetourt	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
6D:							
Calvin	85	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
						Depth to bedrock	0.54
6E:							
Calvin	80	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	0.78	Depth to bedrock	0.54

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
6F:							
Calvin	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.54
7A:							
Clubcaf	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
						Flooding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
8D:							
Dekalb	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Droughty	0.69
						Depth to bedrock	0.54
8E:							
Dekalb	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.69
						Depth to bedrock	0.54
9F:							
Drypond	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
10F:							
Drypond	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
11B:							
Ebbing	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
12C:							
Edneytown	85	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.37
12D:							
Edneytown	85	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50				
12E:							
Edneytown	85	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	0.22		

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
13C:							
Elliber--------	80	Not limited		Not limited		Very limited	
						Gravel content	1.00
						Droughty	0.64
						Slope	0.37
13D:							
Elliber--------	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Gravel content	1.00
						Droughty	0.64
13E:							
Elliber--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	1.00
						Droughty	0.64
14B:							
Ernest---------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
						Depth to cemented pan	0.46
14C:							
Ernest---------	85	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to cemented pan	0.46
						Slope	0.37
15C:							
Faywood--------	85	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.65
						Slope	0.37
15D:							
Faywood--------	85	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50			Depth to bedrock	0.65
15E:							
Faywood--------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Depth to bedrock	0.65
16B:							
Frederick------	85	Not limited		Not limited		Not limited	
16C:							
Frederick------	80	Not limited		Not limited		Somewhat limited	
						Slope	0.37
16D:							
Frederick------	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
16E:							
Frederick------	80	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
17C:							
Frederick------	85	Not limited		Not limited		Very limited	
						Gravel content	1.00
						Slope	0.37
17D:							
Frederick------	85	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Gravel content	1.00
17E:							
Frederick------	80	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
						Gravel content	1.00
18D:							
Greenlee-------	85	Very limited		Very limited		Very limited	
		Too stony	1.00	Too stony	1.00	Content of large stones	1.00
		Slope	0.68	Content of large stones	0.20	Slope	1.00
		Content of large stones	0.20			Droughty	0.02
19C:							
Hagerstown-----	45	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.04
Rock outcrop---	30	Not rated		Not rated		Not rated	
19E:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	1.00	Slope	0.22		
Rock outcrop---	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown-----	80	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.37
20D:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50				
20E:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	0.78		
21D:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	0.04		
Rock outcrop---	30	Not rated		Not rated		Not rated	

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
22C:							
Hagerstown-----	80	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.37
22D:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50				
23C:							
Hayter---------	75	Not limited		Not limited		Somewhat limited	
						Slope	0.37
23D:							
Hayter---------	70	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
24B:							
Ingledove------	80	Not limited		Not limited		Somewhat limited	
						Content of large stones	0.03
25C:							
Konnarock------	80	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	0.95
						Slope	0.37
25D:							
Konnarock------	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Droughty	1.00
						Depth to bedrock	0.95
25E:							
Konnarock------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	1.00
						Depth to bedrock	0.95
26B:							
Lily-----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too stony	0.94	Too stony	0.94	Depth to bedrock	0.90
						Droughty	0.42
26C:							
Lily-----------	80	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.90
		Too stony	0.94	Too stony	0.94	Droughty	0.42
						Slope	0.37
26D:							
Lily-----------	80	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Too stony	0.94	Too stony	0.94	Depth to bedrock	0.90
		Slope	0.50			Droughty	0.42

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
26E:							
Lily-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Depth to bedrock	0.90
		Too stony	0.94	Too stony	0.94	Droughty	0.42
27D:							
Litz-----------	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Droughty	0.58
						Depth to bedrock	0.10
27E:							
Litz-----------	80	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.96	Slope	1.00
						Droughty	0.58
						Depth to bedrock	0.10
27F:							
Litz-----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.58
						Depth to bedrock	0.10
28C:							
Litz-----------	50	Not limited		Not limited		Somewhat limited	
						Droughty	0.58
						Slope	0.37
						Depth to bedrock	0.10
Groseclose-----	30	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
28D:							
Litz-----------	50	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Droughty	0.58
						Depth to bedrock	0.10
Groseclose-----	30	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.50				
28E:							
Litz-----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	0.58
						Depth to bedrock	0.10
Groseclose-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00		
29A:							
Lobdell--------	75	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.19

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
30C:							
Macove---------	85	Very limited		Very limited		Somewhat limited	
		Too stony	1.00	Too stony	1.00	Content of large stones	0.92
						Slope	0.37
30D:							
Macove---------	85	Very limited		Very limited		Very limited	
		Too stony	1.00	Too stony	1.00	Slope	1.00
		Slope	0.50			Content of large stones	0.92
30E:							
Macove---------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Too stony	1.00	Slope	1.00
		Too stony	1.00	Slope	0.96	Content of large stones	0.92
31C:							
Macove---------	75	Not limited		Not limited		Very limited	
						Gravel content	1.00
						Slope	0.37
						Droughty	0.02
31D:							
Macove---------	75	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Gravel content	1.00
						Droughty	0.02
31E:							
Macove---------	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.96	Slope	1.00
						Gravel content	1.00
						Droughty	0.02
32A:							
Maurertown-----	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
33A:							
Mongle---------	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
34B:							
Monongahela----	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
						Depth to cemented pan	0.71

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
34C:							
Monongahela----	85	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to cemented pan	0.71
						Slope	0.37
35C:							
Pigeonroost----	80	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.06
35D:							
Pigeonroost----	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Depth to bedrock	0.06
35E:							
Pigeonroost----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.06
36F:							
Rock outcrop---	40	Not rated		Not rated		Not rated	
Opequon--------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
37B:							
Shottower------	85	Not limited		Not limited		Not limited	
37C:							
Shottower------	85	Not limited		Not limited		Somewhat limited	
						Slope	0.63
37D:							
Shottower------	85	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
38A:							
Sindion--------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
						Flooding	0.60
39A:							
Speedwell------	85	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
40B:							
Tate-----------	80	Not limited		Not limited		Not limited	
40C:							
Tate-----------	80	Not limited		Not limited		Somewhat limited	
						Slope	0.37

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
40D:							
Tate	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
41B:							
Timberville	45	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
Marbie	35	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Depth to cemented pan	1.00
						Flooding	1.00
						Depth to saturated zone	0.19
42C:							
Timberville	45	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.16
Marbie	35	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to cemented pan	1.00
						Depth to saturated zone	0.19
						Slope	0.16
43B:							
Tumbling	85	Somewhat limited		Somewhat limited		Not limited	
		Too stony	0.76	Too stony	0.76		
43C:							
Tumbling	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too stony	0.76	Too stony	0.76	Slope	0.37
43D:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Too stony	0.76	Too stony	0.76	Slope	1.00
		Slope	0.50				
44B:							
Tumbling	85	Not limited		Not limited		Not limited	
44C:							
Tumbling	85	Not limited		Not limited		Somewhat limited	
						Slope	0.37
44D:							
Tumbling	85	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
44E:							
Tumbling	85	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
45:							
Udorthents	70	Not rated		Not rated		Not rated	
46:							
Udorthents	95	Not rated		Not rated		Not rated	

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
47:							
Udorthents-----	40	Not rated		Not rated		Not rated	
Urban land-----	35	Not rated		Not rated		Not rated	
48:							
Urban land-----	85	Not rated		Not rated		Not rated	
49C:							
Watahala-------	85	Not limited		Not limited		Very limited	
						Gravel content	1.00
						Slope	0.37
						Droughty	0.10
49D:							
Watahala-------	85	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Gravel content	1.00
						Droughty	0.10
49E:							
Watahala-------	85	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
						Gravel content	1.00
						Droughty	0.10
50D:							
Weikert--------	85	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
50E, 50F:							
Weikert--------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
51C:							
Westmoreland---	85	Not limited		Not limited		Somewhat limited	
						Slope	0.37
51D:							
Westmoreland---	85	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
51E, 51F:							
Westmoreland---	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
52D:							
Westmoreland---	45	Not limited		Not limited		Very limited	
						Slope	1.00
Rock outcrop---	30	Not rated		Not rated		Not rated	
52E, 52F:							
Westmoreland---	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop---	30	Not rated		Not rated		Not rated	

Table 11.—Recreational Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
53B:							
Wheeling-------	80	Not limited		Not limited		Not limited	
54A:							
Wolfgap--------	85	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
55B:							
Wyrick---------	50	Not limited		Not limited		Not limited	
Marbie---------	30	Not limited		Not limited		Very limited	
						Depth to cemented pan	1.00
						Depth to saturated zone	0.19
						Droughty	0.03
55C:							
Wyrick---------	50	Not limited		Not limited		Somewhat limited	
						Slope	0.37
Marbie---------	30	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to cemented pan	1.00
						Slope	0.37
						Depth to saturated zone	0.19
55D:							
Wyrick---------	50	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
Marbie---------	30	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to cemented pan	1.00
		Slope	0.50			Slope	1.00
						Depth to saturated zone	0.19
W:							
Water----------	100	Not rated		Not rated		Not rated	

Table 12.—Building Site Development, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1B:							
Allegheny------	85	Not limited		Not limited		Somewhat limited	
						Slope	0.12
1C:							
Allegheny------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
2A:							
Atkins---------	75	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
3D:							
Berks----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.06	Slope	1.00	Depth to hard bedrock	0.06
3E, 3F:							
Berks----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.06	Depth to hard bedrock	1.00	Depth to hard bedrock	0.06
4D, 4E:							
Bland----------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to hard bedrock	0.90
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
5B:							
Botetourt------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
6D:							
Calvin---------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard berock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Depth to hard bedrock	0.54
6E, 6F:							
Calvin---------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
7A:							
Clubcaf	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
8D:							
Dekalb	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
8E:							
Dekalb	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54
9F:							
Drypond	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
10F:							
Drypond	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
11B:							
Ebbing	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
12C:							
Edneytown	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
12D, 12E:							
Edneytown	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
13C:							
Elliber	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
13D, 13E:							
Elliber	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
14B:							
Ernest	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
		Shrink-swell	0.50	Depth to thick cemented pan	1.00	Shrink-swell	0.50
		Depth to thick cemented pan	0.46	Shrink-swell	0.50	Depth to thick cemented pan	0.46
14C:							
Ernest	85	Somewhat limited		Very limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to thick cemented pan	1.00	Depth to saturated zone	0.98
		Depth to thick cemented pan	0.46	Shrink-swell	0.50	Shrink-swell	0.50
15C:							
Faywood	85	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Depth to hard bedrock	0.64
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
15D, 15E:							
Faywood	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
16B:							
Frederick	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
16C:							
Frederick	80	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
16D, 16E:							
Frederick	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
17C:							
Frederick	85	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Shrink-swell	0.50
17D:							
Frederick	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
17E:							
Frederick	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
18D:							
Greenlee-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.99	Content of large stones	0.99	Content of large stones	0.99
19C:							
Hagerstown-----	45	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.04	Depth to hard bedrock	0.42	Shrink-swell	0.50
				Slope	0.04		
Rock outcrop---	30	Not rated		Not rated		Not rated	
19E:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to hard bedrock	0.42		
Rock outcrop---	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown-----	80	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Depth to hard bedrock	0.42	Shrink-swell	0.50
				Slope	0.37		
20D, 20E:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to hard bedrock	0.42		
21D:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to hard bedrock	0.42		
Rock outcrop---	30	Not rated		Not rated		Not rated	
22C:							
Hagerstown-----	80	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.37	Depth to hard bedrock	0.42	Shrink-swell	0.50
				Slope	0.37		
22D:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to hard bedrock	0.42		

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
23C:							
Hayter	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
23D:							
Hayter	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
24B:							
Ingledove	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
25C:							
Konnarock	80	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.95	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.37	Slope	0.37	Depth to hard bedrock	0.95
25D, 25E:							
Konnarock	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.95	Depth to hard bedrock	1.00	Depth to hard bedrock	0.95
26B:							
Lily	80	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to hard bedrock	0.90
						Slope	0.12
26C:							
Lily	80	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.37	Slope	0.37	Depth to hard bedrock	0.90
26D, 26E:							
Lily	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to hard bedrock	0.90
27D, 27E:							
Litz	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.10	Depth to hard bedrock	1.00	Depth to hard bedrock	0.10
27F:							
Litz	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.10	Depth to hard bedrock	1.00	Depth to hard bedrock	0.10
28C:							
Litz	50	Somewhat limited		Very limited		Very limited	
		Slope	0.37	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.10	Slope	0.37	Depth to hard bedrock	0.10

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
28C:							
Groseclose-----	30	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
28D:							
Litz-----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.10	Depth to hard bedrock	1.00	Depth to hard bedrock	0.10
Groseclose-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
28E:							
Litz-----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.10	Depth to hard bedrock	1.00	Depth to hard bedrock	0.10
Groseclose-----	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
29A:							
Lobdell--------	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
30C:							
Macove---------	85	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Content of large stones	1.00	Slope	1.00
		Slope	0.37	Slope	0.37	Content of large stones	1.00
30D, 30E:							
Macove---------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
31C:							
Macove---------	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
31D, 31E:							
Macove---------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
32A:							
Maurertown-----	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
33A:							
Mongle	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
34B:							
Monongahela	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
		Depth to thick cemented pan	0.71	Depth to thick cemented pan	1.00	Depth to thick cemented pan	0.71
						Slope	0.12
34C:							
Monongahela	85	Somewhat limited		Very limited		Very limited	
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Slope	1.00
		Depth to thick cemented pan	0.71	Depth to thick cemented pan	1.00	Depth to saturated zone	0.98
		Slope	0.37	Slope	0.37	Depth to thick cemented pan	0.71
35C:							
Pigeonroost	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.06		
35D, 35E:							
Pigeonroost	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.06		
36F:							
Rock outcrop	40	Not rated		Not rated		Not rated	
Opequon	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Shrink-swell	1.00	Depth to hard bedrock	1.00
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Shrink-swell	1.00
37B:							
Shottower	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
37C:							
Shottower	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
37D:							
Shottower	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
38A:							
Sindion----------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
39A:							
Speedwell------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
40B:							
Tate-----------	80	Not limited		Not limited		Somewhat limited	
						Slope	0.12
40C:							
Tate-----------	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
40D:							
Tate-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
41B:							
Timberville----	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
						Slope	0.12
Marbie---------	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to thick cemented pan	1.00	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
		Shrink-swell	0.50	Depth to thick cemented pan	1.00	Shrink-swell	0.50
42C:							
Timberville----	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Marbie---------	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to thick cemented pan	1.00	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
		Shrink-swell	0.50	Depth to thick cemented pan	1.00	Slope	1.00
43B:							
Tumbling-------	85	Not limited		Not limited		Not limited	
43C:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
43D:							
Tumbling-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
44B:							
Tumbling-------	85	Not limited		Not limited		Not limited	

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
44C:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
44D, 44E:							
Tumbling-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
45:							
Udorthents-----	70	Not rated		Not rated		Not rated	
46:							
Udorthents-----	95	Not rated		Not rated		Not rated	
47:							
Udorthents-----	40	Not rated		Not rated		Not rated	
Urban land-----	35	Not rated		Not rated		Not rated	
48:							
Urban land-----	85	Not rated		Not rated		Not rated	
49C:							
Watahala-------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
49D, 49E:							
Watahala-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
50D, 50E, 50F:							
Weikert--------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
51C:							
Westmoreland---	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
				Depth to hard bedrock	0.32		
51D, 51E, 51F:							
Westmoreland---	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to hard bedrock	0.32		
52D, 52E, 52F:							
Westmoreland---	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to hard bedrock	0.32		
Rock outcrop---	30	Not rated		Not rated		Not rated	
53B:							
Wheeling-------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
						Slope	0.12

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
54A:							
Wolfgap--------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
55B:							
Wyrick---------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.22	Shrink-swell	0.22	Shrink-swell	0.22
						Slope	0.12
Marbie---------	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
		Shrink-swell	0.50	Depth to thick cemented pan	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.39	Shrink-swell	0.50	Depth to saturated zone	0.39
55C:							
Wyrick---------	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
		Shrink-swell	0.22	Shrink-swell	0.22	Shrink-swell	0.22
Marbie---------	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
		Shrink-swell	0.50	Depth to thick cemented pan	1.00	Slope	1.00
		Depth to saturated zone	0.39	Shrink-swell	0.50	Shrink-swell	0.50
55D:							
Wyrick---------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.22	Shrink-swell	0.22	Shrink-swell	0.22
Marbie---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to thick cemented pan	1.00	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
		Shrink-swell	0.50	Depth to thick cemented pan	1.00	Shrink-swell	0.50
W:							
Water----------	100	Not rated		Not rated		Not rated	

Table 12.—Building Site Development, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1B:							
Allegheny------	85	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
1C:							
Allegheny------	85	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	1.00	Slope	0.16
		Slope	0.16	Slope	0.16		
2A:							
Atkins---------	75	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
3D, 3E, 3F:							
Berks----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.99
		Depth to hard bedrock	0.06	Cutbanks cave	0.10	Depth to bedrock	0.06
4D, 4E:							
Bland----------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00	Slope	1.00	Depth to bedrock	0.90
		Depth to hard bedrock	0.90	Too clayey	0.50	Droughty	0.16
5B:							
Botetourt------	80	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
		Frost action	0.50				
6D:							
Calvin---------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Depth to bedrock	0.54
		Frost action	0.50	Cutbanks cave	0.10		
6E, 6F:							
Calvin---------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Depth to bedrock	0.54
		Frost action	0.50	Cutbanks cave	0.10		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7A:							
Clubcaf	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
8D:							
Dekalb	80	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Droughty	0.69
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	0.54
8E:							
Dekalb	85	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.54	Slope	1.00	Droughty	0.69
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	0.54
9F:							
Drypond	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
10F:							
Drypond	75	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00
11B:							
Ebbing	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
		Flooding	0.40				
12C:							
Edneytown	85	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	1.00	Slope	0.37
		Slope	0.37	Slope	0.37		
12D, 12E:							
Edneytown	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00		
13C:							
Elliber	80	Somewhat limited		Very limited		Very limited	
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Droughty	0.64
						Slope	0.37

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
13D, 13E:							
Elliber--------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	1.00
						Droughty	0.64
14B:							
Ernest---------	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to thick cemented pan	1.00	Depth to saturated zone	0.75
		Low strength	0.78	Depth to saturated zone	1.00	Depth to cemented pan	0.46
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
14C:							
Ernest---------	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to thick cemented pan	1.00	Depth to saturated zone	0.75
		Low strength	0.78	Depth to saturated zone	1.00	Depth to cemented pan	0.46
		Depth to saturated zone	0.75	Slope	0.37	Slope	0.37
15C:							
Faywood--------	85	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
		Depth to hard bedrock	0.64	Too clayey	0.50	Slope	0.37
		Shrink-swell	0.50	Slope	0.37		
15D, 15E:							
Faywood--------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Low strength	1.00	Slope	1.00	Depth to bedrock	0.65
		Depth to hard bedrock	0.64	Too clayey	0.50		
16B:							
Frederick------	85	Very limited		Very limited		Not limited	
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
16C:							
Frederick------	80	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Slope	0.37
		Shrink-swell	0.50	Slope	0.37		
		Frost action	0.50	Cutbanks cave	0.10		
16D, 16E:							
Frederick------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	0.50	Cutbanks cave	0.10		
17C:							
Frederick------	85	Very limited		Very limited		Very limited	
		Low strength	1.00	Too clayey	1.00	Gravel content	1.00
		Shrink-swell	0.50	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
17D:							
Frederick------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00	Gravel content	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
17E:							
Frederick------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	1.00	Gravel content	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
18D:							
Greenlee-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Content of large stones	0.99	Content of large stones	0.99	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.02
19C:							
Hagerstown-----	45	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.88	Slope	0.04
		Shrink-swell	0.50	Depth to hard bedrock	0.42		
		Frost action	0.50	Cutbanks cave	0.10		
Rock outcrop---	30	Not rated		Not rated		Not rated	
19E:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	0.88		
		Shrink-swell	0.50	Depth to hard bedrock	0.42		
Rock outcrop---	30	Not rated		Not rated		Not rated	
20C:							
Hagerwtown-----	80	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.88	Slope	0.37
		Shrink-swell	0.50	Depth to hard bedrock	0.42		
		Frost action	0.50	Slope	0.37		
20D, 20E:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	0.88		
		Shrink-swell	0.50	Depth to hard bedrock	0.42		
21D:							
Hagerstown-----	45	Very limited		Very limited		Very limited	
		Low strength	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Too clayey	0.88		
		Shrink-swell	0.50	Depth to hard bedrock	0.42		
Rock outcrop---	30	Not rated		Not rated		Not rated	

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
22C:							
Hagerstown-----	80	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.88	Slope	0.37
		Shrink-swell	0.50	Depth to hard bedrock	0.42		
		Frost action	0.50	Slope	0.37		
22D:							
Hagerstown-----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	0.88		
		Shrink-swell	0.50	Depth to hard bedrock	0.42		
23C:							
Hayter---------	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
23D:							
Hayter---------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10		
24B:							
Ingledove------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	0.10	Content of large stones	0.03
		Flooding	0.40				
25C:							
Konnarock------	80	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.95	Depth to hard bedrock	1.00	Droughty	1.00
						Depth to bedrock	0.95
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
25D, 25E:							
Konnarock------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.95			Droughty	1.00
				Slope	1.00	Depth to bedrock	0.95
		Frost action	0.50	Cutbanks cave	0.10		
26B:							
Lily-----------	80	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to bedrock	0.90
						Droughty	0.42
		Frost action	0.50	Cutbanks cave	0.10		
26C:							
Lily-----------	80	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to bedrock	0.90
						Droughty	0.42
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
26D, 26E:							
Lily	80	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.90	Slope	1.00	Depth to bedrock	0.90
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.42
27D, 27E:							
Litz	80	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard berock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.58
		Depth to hard bedrock	0.10	Cutbanks cave	0.10	Depth to bedrock	0.10
27F:							
Litz	65	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope		Droughty	0.58
		Depth to hard bedrock	0.10	Cutbanks cave	0.10	Depth to bedrock	0.10
28C:							
Litz	50	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Depth to hard bedrock	1.00	Droughty	0.58
		Slope	0.37	Slope	0.37	Slope	0.37
		Depth to hard bedrock	0.10	Cutbanks cave	0.10	Depth to bedrock	0.10
Groseclose	30	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Too clayey	0.88	Slope	0.63
		Low strength	1.00	Slope	0.63		
		Slope	0.63	Cutbanks cave	0.10		
28D:							
Litz	50	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.58
		Depth to hard bedrock	0.10	Cutbanks cave	0.10	Depth to bedrock	0.10
Groseclose	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Too clayey	0.88		
		Low strength	1.00	Cutbanks cave	0.10		
28E:							
Litz	45	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.58
		Depth to hard bedrock	0.10	Cutbanks cave	0.10	Depth to bedrock	0.10
Groseclose	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Too clayey	0.88		
		Low strength	1.00	Cutbanks cave	0.10		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
29A:							
Lobdell	75	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Flooding	0.60	Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
30C:							
Macove	85	Very limited		Very limited		Somewhat limited	
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	0.92
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
30D, 30E:							
Macove	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	0.92
		Frost action	0.50	Cutbanks cave	0.10		
31C:							
Macove	75	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Slope	0.37	Gravel content	1.00
		Slope	0.37	Cutbanks cave	0.10	Slope	0.37
						Droughty	0.02
31D, 31E:							
Macove	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Gravel content	1.00
						Droughty	0.02
32A:							
Maurertown	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Cutbanks cave	0.10		
33A:							
Mongle	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Cutbanks cave	0.10		
		Flooding	0.40				
34B:							
Monongahela	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to thick cemented pan	1.00	Depth to saturated zone	0.75
		Depth to thick cemented pan	0.71	Depth to saturated zone	1.00	Depth to cemented pan	0.71
		Frost action	0.50	Cutbanks cave	0.10		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
34C:							
Monongahela----	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to thick cemented pan	1.00	Depth to saturated zone	0.75
		Depth to thick cemented pan	0.71	Depth to saturated zone	1.00	Depth to cemented pan	0.71
		Frost action	0.50	Slope	0.37	Slope	0.37
35C:							
Pigeonroost----	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	0.06
				Depth to soft bedrock	0.06		
35D, 35E:							
Pigeonroost----	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	0.06
				Depth to soft bedrock	0.06		
36F:							
Rock outcrop---	40	Not rated		Not rated		Not rated	
Opequon--------	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Droughty	1.00
37B:							
Shottower------	85	Somewhat limited		Very limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	1.00		
		Frost action	0.50				
		Low strength	0.10				
37C:							
Shottower------	85	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Cutbanks cave	1.00	Slope	0.63
		Shrink-swell	0.50	Slope	0.63		
		Frost action	0.50				
37D:							
Shottower------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	1.00		
		Frost action	0.50				
38A:							
Sindion--------	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
39A:							
Speedwell------	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Cutbanks cave	0.10		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
40B:							
Tate-----------	80	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
40C:							
Tate-----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
		Low strength	0.22				
40D:							
Tate-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
41B:							
Timberville----	45	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
		Frost action	0.50	Cutbanks cave	0.10		
Marbie---------	35	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Shrink-swell	0.50	Flooding	0.80	Depth to saturated zone	0.19
42C:							
Timberville----	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Slope	0.16	Slope	0.16
		Flooding	0.40	Cutbanks cave	0.10		
		Slope	0.16				
Marbie---------	35	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Frost action	0.50	Slope	0.16	Slope	0.16
43B:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.10	Too clayey	0.03		
43C:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
		Low strength	0.10	Too clayey	0.03		
43D:							
Tumbling-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.10	Too clayey	0.03		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
44B:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.10	Too clayey	0.03		
44C:							
Tumbling-------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
		Low strength	0.10	Too clayey	0.03		
44D, 44E:							
Tumbling-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Low strength	0.10	Too clayey	0.03		
45:							
Udorthents-----	70	Not rated		Not rated		Not rated	
46:							
Udorthents-----	95	Not rated		Not rated		Not rated	
47:							
Udorthents-----	40	Not rated		Not rated		Not rated	
Urban land-----	35	Not rated		Not rated		Not rated	
48:							
Urban land-----	85	Not rated		Not rated		Not rated	
49C:							
Watahala-------	85	Somewhat limited		Very limited		Very limited	
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	1.00
		Slope	0.37	Too clayey	0.50	Slope	0.37
				Slope	0.37	Droughty	0.10
49D, 49E:							
Watahala-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	1.00
				Too clayey	0.50	Droughty	0.10
50D, 50E, 50F:							
Weikert--------	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10		
51C:							
Westmoreland---	85	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.37	Slope	0.37
		Frost action	0.50	Depth to hard bedrock	0.32		
		Slope	0.37				
				Cutbanks cave	0.10		

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
51D, 51E, 51F:							
Westmoreland---	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to hard bedrock	0.32		
		Frost action	0.50	Cutbanks cave	0.10		
52D, 52E, 52F:							
Westmoreland---	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to hard bedrock	0.32		
		Frost action	0.50	Cutbanks cave	0.10		
Rock outcrop---	30	Not rated		Not rated		Not rated	
53B:							
Wheeling-------	80	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40				
54A:							
Wolfgap--------	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Cutbanks cave	0.10		
55B:							
Wyrick---------	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
		Shrink-swell	0.22				
Marbie---------	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.03
55C:							
Wyrick---------	50	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10		
		Slope	0.37				
Marbie---------	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	0.37
		Frost action	0.50	Slope	0.37	Depth to saturated zone	0.19
55D:							
Wyrick---------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				

Table 12.—Building Site Development, Part II—Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
55D:							
Marbie----------	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.19
W:							
Water-----------	100	Not rated		Not rated		Not rated	

Table 13.—Sanitary Facilities, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Septic tank absorption fields: Value	Sewage lagoons: Rating class and limiting features	Sewage lagoons: Value
1B:					
Allegheny	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.68
				Seepage	0.50
1C:					
Allegheny	85	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
2A:					
Atkins	75	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
3D, 3E, 3F:					
Berks	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
4D, 4E:					
Bland	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00		
5B:					
Botetourt	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
6D:					
Calvin	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
6E, 6F:					
Calvin	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
7A:					
Clubcaf	85	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
8D:					
Dekalb	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
8E:					
Dekalb	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
9F:					
Drypond	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
Rock outcrop	30	Not rated		Not rated	
10F:					
Drypond	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
11B:					
Ebbing	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
12C:					
Edneytown	85	Very limited		Very limited	
		Seepage (bottom layer)	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	1.00
		Slope	0.37		
12D, 12E:					
Edneytown	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
		Restricted permeability	0.50		

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
13C:					
Elliber	80	Very limited		Very limited	
		Seepage (bottom layer)	1.00	Slope	1.00
				Seepage	1.00
		Slope	0.37		
13D, 13E:					
Elliber	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
14B:					
Ernest	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Restricted permeability	0.50	Slope	0.68
14C:					
Ernest	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	0.99
		Restricted permeability	0.50		
15C:					
Faywood	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Restricted permeability	1.00	Slope	1.00
		Slope	0.37		
15D, 15E:					
Faywood	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00		
		Restricted permeability	1.00	Slope	1.00
16B:					
Frederick	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.68
				Seepage	0.50
16C:					
Frederick	80	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		
16D, 16E:					
Frederick	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
17C:					
Frederick-----------	85	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
17D, 17E:					
Frederick-----------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
18D:					
Greenlee------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Content of large stones	1.00
		Content of large stones	0.99	Seepage	1.00
19C:					
Hagerstown----------	45	Somewhat limited		Very limited	
		Depth to bedrock	0.78	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
		Slope	0.04	Depth to hard bedrock	0.42
Rock outcrop--------	30	Not rated		Not rated	
19E:					
Hagerstown----------	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.78	Seepage	0.50
		Restricted permeability	0.50	Depth to hard bedrock	0.42
Rock outcrop--------	30	Not rated		Not rated	
20C:					
Hagerstown----------	80	Somewhat limited		Very limited	
		Depth to bedrock	0.78	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
		Slope	0.37	Depth to hard bedrock	0.42
20D, 20E:					
Hagerstown----------	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.78	Seepage	0.50
		Restricted permeability	0.50	Depth to hard bedrock	0.42
21D:					
Hagerstown----------	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.78	Seepage	0.50
		Restricted permeability	0.50	Depth to hard bedrock	0.42
Rock outcrop--------	30	Not rated		Not rated	

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
22C:					
Hagerstown----------	80	Somewhat limited		Very limited	
		Depth to bedrock	0.78	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
		Slope	0.37	Depth to hard bedrock	0.42
22D:					
Hagerstown----------	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.78	Seepage	0.50
		Restricted permeability	0.50	Depth to hard bedrock	0.42
23C:					
Hayter--------------	75	Very limited		Very limited	
		Seepage (bottom layer)	1.00	Slope	1.00
				Seepage	1.00
		Slope	0.37		
23D:					
Hayter--------------	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
24B:					
Ingledove-----------	80	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Flooding	0.40
		Flooding	0.40	Slope	0.08
25C:					
Konnarock-----------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage (bottom layer)	1.00	Slope	1.00
		Slope	0.37	Seepage	1.00
25D, 25E:					
Konnarock-----------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
26B:					
Lily----------------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
				Slope	0.68
26C:					
Lily----------------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage (bottom layer)	1.00	Slope	1.00
		Slope	0.37	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
26D, 26E:					
Lily	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
27D, 27E:					
Litz	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
27F:					
Litz	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
28C:					
Litz	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
Groseclose	30	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.63		
28D:					
Litz	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Groseclose	30	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00		
28E:					
Litz	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Groseclose	30	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00		

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
29A:					
Lobdell	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
30C:					
Macove	85	Very limited		Very limited	
		Content of large stones	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
		Slope	0.37	Content of large stones	1.00
30D, 30E:					
Macove	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Seepage	1.00
		Seepage (bottom layer)	1.00	Content of large stones	1.00
31C:					
Macove	75	Very limited		Very limited	
		Seepage (bottom layer)	1.00	Slope	1.00
		Slope	0.37	Seepage	1.00
31D, 31E:					
Macove	75	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00
32A:					
Maurertown	80	Very limited		Very limited	
		Restricted permeability	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.40
33A:					
Mongle	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
34B:					
Monongahela	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Restricted permeability	0.50	Slope	0.68

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
34C:					
Monongahela---------	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Restricted permeability	0.50	Depth to saturated zone	0.99
35C:					
Pigeonroost---------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
35D, 35E:					
Pigeonroost---------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
36F:					
Rock outcrop--------	40	Not rated		Not rated	
Opequon-------------	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.27
37B:					
Shottower-----------	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.32
37C:					
Shottower-----------	85	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
37D:					
Shottower-----------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
38A:					
Sindion-------------	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
39A:					
Speedwell	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
40B:					
Tate	80	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.68
				Seepage	0.50
40C:					
Tate	80	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		
40D:					
Tate	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
41B:					
Timberville	45	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.68
Marbie	35	Very limited		Very limited	
		Flooding	1.00	Depth to cemented pan	1.00
		Depth to cemented pan	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.75
42C:					
Timberville	45	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	1.00
		Flooding	0.40	Flooding	0.40
		Slope	0.16		
Marbie	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	0.75
		Flooding	0.40		
43B:					
Tumbling	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.32
43C:					
Tumbling	85	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
43D:					
Tumbling-----------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
44B:					
Tumbling-----------	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.32
44C:					
Tumbling-----------	85	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		
44D, 44E:					
Tumbling-----------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
45:					
Udorthents----------	70	Not rated		Not rated	
46:					
Udorthents----------	95	Not rated		Not rated	
47:					
Udorthents----------	40	Not rated		Not rated	
Urban land----------	35	Not rated		Not rated	
48:					
Urban land----------	85	Not rated		Not rated	
49C:					
Watahala-----------	85	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	1.00
		Slope	0.37		
49D, 49E:					
Watahala-----------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	1.00
50D, 50E, 50F:					
Weikert-------------	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
51C:					
Westmoreland	85	Somewhat limited		Very limited	
		Depth to bedrock	0.73	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
		Slope	0.37	Depth to hard bedrock	0.32
51D, 51E, 51F:					
Westmoreland	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.73	Seepage	0.50
		Restricted permeability	0.50	Depth to hard bedrock	0.32
52D, 52E, 52F:					
Westmoreland	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.73	Seepage	0.50
		Restricted permeability	0.50	Depth to hard bedrock	0.32
Rock outcrop	30	Not rated		Not rated	
53B:					
Wheeling	80	Somewhat limited		Very limited	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.68
		Flooding	0.40	Flooding	0.40
54A:					
Wolfgap	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
55B:					
Wyrick	50	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.68
				Seepage	0.50
Marbie	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.75
				Slope	0.68
55C:					
Wyrick	50	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
		Slope	0.37		
Marbie	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Slope	0.37	Depth to saturated zone	0.75

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Septic tank absorption fields: Value	Sewage lagoons: Rating class and limiting features	Sewage lagoons: Value
55D:					
Wyrick	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Marbie	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	1.00	Slope	1.00
		Slope	1.00	Depth to saturated zone	0.75
W:					
Water	100	Not rated		Not rated	

Table 13.—Sanitary Facilities, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1B:							
Allegheny	85	Not limited		Not limited		Somewhat limited	
						Gravel content	0.26
1C:							
Allegheny	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Gravel content	0.26
						Slope	0.16
2A:							
Atkins	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Seepage	0.13
3D:							
Berks	75	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Slope	1.00
3E, 3F:							
Berks	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	1.00
4D, 4E:							
Bland	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
5B:							
Botetourt	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Too clayey	0.50	Flooding	0.40	Too clayey	0.50
		Flooding	0.40				
6D:							
Calvin	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	0.95

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
6E, 6F:							
Calvin	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	0.95
7A:							
Clubcaf	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00		
8D:							
Dekalb	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Depth to bedrock	1.00	Seepage	1.00
8E:							
Dekalb	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Depth to bedrock	1.00	Seepage	1.00
9F:							
Drypond	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage (bottom layer)	1.00			Seepage	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
10F:							
Drypond	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage (bottom layer)	1.00			Seepage	1.00
11B:							
Ebbing	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Flooding	0.40	Flooding	0.40		
12C:							
Edneytown	85	Very limited		Very limited		Somewhat limited	
		Seepage (bottom layer)	1.00	Seepage	1.00	Seepage	0.50
		Too sandy	0.50	Slope	0.37	Too sandy	0.50
		Slope	0.37			Slope	0.37

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12D, 12E:							
Edneytown	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Seepage	0.50
		Too sandy	0.50			Too sandy	0.50
13C:							
Elliber	80	Very limited		Very limited		Very limited	
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	0.37
						Seepage	0.21
13D, 13E:							
Elliber	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	1.00
						Seepage	0.21
14B:							
Ernest	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thick cemented pan	1.00	Depth to saturated zone	0.99	Depth to saturated zone	0.99
14C:							
Ernest	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thick cemented pan	1.00	Depth to saturated zone	0.99	Depth to saturated zone	0.99
		Slope	0.37	Slope	0.37	Slope	0.37
15C:							
Faywood	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
15D, 15E:							
Faywood	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
16B:							
Frederick	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
16C:							
Frederick	80	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
						Slope	0.37

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
16D, 16E:							
Frederick-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
17C:							
Frederick-----------	85	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Hard to compact	1.00
						Slope	0.37
17D:							
Frederick-----------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
17E:							
Frederick-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
18D:							
Greenlee------------	85	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Slope	1.00	Content of large stones	1.00
		Slope	1.00	Seepage	1.00	Slope	1.00
		Seepage (bottom layer)	1.00			Seepage	0.50
19C:							
Hagerstown----------	45	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	0.42	Too clayey	1.00
		Too clayey	1.00	Slope	0.04	Hard to compact	1.00
		Slope	0.04			Depth to bedrock	0.42
Rock outcrop--------	30	Not rated		Not rated		Not rated	
19E:							
Hagerstown----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.42	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown----------	80	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	0.42	Too clayey	1.00
		Too clayey	1.00	Slope	0.37	Hard to compact	1.00
		Slope	0.37			Depth to bedrock	0.42
20D, 20E:							
Hagerstown----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.42	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21D:							
Hagerstown----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Too clayey	1.00
		Too clayey	1.00	Depth to bedrock	0.42	Hard to compact	1.00
		Slope	1.00			Slope	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
22C:							
Hagerstown----------	80	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	0.42	Too clayey	1.00
		Too clayey	1.00	Slope	0.37	Hard to compact	1.00
		Slope	0.37			Depth to bedrock	0.42
22D:							
Hagerstown----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.42	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
23C:							
Hayter--------------	75	Very limited		Very limited		Somewhat limited	
		Seepage (bottom layer)	1.00	Seepage	1.00	Seepage	0.50
				Slope	0.37	Slope	0.37
		Slope	0.37				
23D:							
Hayter--------------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Seepage	0.50
24B:							
Ingledove-----------	80	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
25C:							
Konnarock-----------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	1.00
				Slope	0.37	Seepage	0.50
		Slope	0.37				
25D, 25E:							
Konnarock-----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	1.00
26B:							
Lily----------------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Seepage	0.50

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
26C:							
Lily----------------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Seepage	0.50
		Slope	0.37	Slope	0.37	Slope	0.37
26D, 26E:							
Lily----------------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Seepage	0.50
27D, 27E:							
Litz----------------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Gravel content	1.00
27F:							
Litz----------------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Gravel content	1.00
28C:							
Litz----------------	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.37	Slope	0.37	Gravel content	1.00
						Slope	0.37
Groseclose----------	30	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
						Slope	0.63
28D:							
Litz----------------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Gravel content	1.00
Groseclose----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
28E:							
Litz----------------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Gravel content	1.00
Groseclose----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
29A:							
Lobdell	75	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Seepage (bottom layer)	1.00	Seepage	1.00		
30C:							
Macove	85	Very limited		Very limited		Very limited	
		Seepage (bottom layer)	1.00	Seepage	1.00	Content of large stones	1.00
		Content of large stones	1.00	Slope	0.37	Seepage	0.50
		Slope	0.37			Slope	0.37
30D, 30E:							
Macove	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Content of large stones	1.00
		Content of large stones	1.00			Seepage	0.50
31C:							
Macove	75	Very limited		Very limited		Very limited	
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Seepage	0.50
						Slope	0.37
31D, 31E:							
Macove	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage (bottom layer)	1.00	Seepage	1.00	Gravel content	1.00
						Seepage	0.50
32A:							
Maurertown	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Flooding	0.40	Too clayey	0.50
33A:							
Mongle	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
34B:							
Monongahela	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thick cemented pan	1.00	Depth to saturated zone	0.99	Depth to saturated zone	0.99
		Too clayey	0.50			Too clayey	0.50

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
34C:							
Monongahela	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thick cemented pan	1.00	Depth to saturated zone	0.99	Depth to saturated zone	0.99
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
35C:							
Pigeonroost	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
35D, 35E:							
Pigeonroost	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
36F:							
Rock outcrop	40	Not rated		Not rated		Not rated	
Opequon	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
37B:							
Shottower	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
37C:							
Shottower	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
37D:							
Shottower	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
38A:							
Sindion	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
39A:							
Speedwell	85	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
40B:							
Tate	80	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
40C:							
Tate	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
		Slope	0.37			Slope	0.37

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40D:							
Tate	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
41B:							
Timberville	45	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.50
				Seepage	1.00		
Marbie	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to cemented pan	1.00
		Depth to thick cemented pan	1.00	Depth to cemented pan	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	0.99	Depth to saturated zone	0.75		
42C:							
Timberville	45	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.40	Seepage	1.00	Seepage	0.50
		Slope	0.16	Flooding	0.40	Slope	0.16
				Slope	0.16		
Marbie	35	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.75	Depth to saturated zone	0.86
		Flooding	0.40	Flooding	0.40	Slope	0.16
43B:							
Tumbling	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
43C:							
Tumbling	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
		Slope	0.37			Slope	0.37
43D:							
Tumbling	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
44B:							
Tumbling	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
44C:							
Tumbling	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.37	Too clayey	0.50
		Slope	0.37			Slope	0.37
44D, 44E:							
Tumbling	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
45:							
Udorthents	70	Not rated		Very limited		Not rated	
				Slope	1.00		
46:							
Udorthents	95	Not rated		Very limited		Not rated	
				Slope	1.00		
47:							
Udorthents	40	Not rated		Very limited		Not rated	
				Slope	1.00		
Urban land	35	Not rated		Not rated		Not rated	
48:							
Urban land	85	Not rated		Not rated		Not rated	
49C:							
Watahala	85	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.37	Seepage	1.00	Seepage	0.50
				Slope	0.37	Slope	0.37
						Gravel content	0.36
49D, 49E:							
Watahala	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Seepage	1.00	Seepage	0.50
						Gravel content	0.36
50D, 50E, 50F:							
Weikert	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage (bottom layer)	1.00			Gravel content	1.00
51C:							
Westmoreland	85	Very limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	1.00	Slope	0.37	Gravel content	0.93
		Too clayey	0.50	Depth to bedrock	0.32	Too clayey	0.50
		Slope	0.37			Slope	0.37
51D, 51E, 51F:							
Westmoreland	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.32	Gravel content	0.93
		Too clayey	0.50			Too clayey	0.50
52D:							
Westmoreland	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to bedrock	0.32	Gravel content	0.93
		Too clayey	0.50			Too clayey	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
52E, 52F:							
Westmoreland	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.32	Gravel content	0.93
		Too clayey	0.50			Too clayey	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	
53B:							
Wheeling	80	Somewhat limited		Very limited		Not limited	
		Flooding	0.40	Seepage	1.00		
				Flooding	0.40		
54A:							
Wolfgap	85	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
55B:							
Wyrick	50	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
Marbie	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.75	Depth to saturated zone	0.86
55C:							
Wyrick	50	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.37	Too clayey	1.00
		Slope	0.37			Slope	0.37
Marbie	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.75	Depth to saturated zone	0.86
		Slope	0.37	Slope	0.37	Slope	0.37
55D:							
Wyrick	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
Marbie	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thick cemented pan	1.00	Slope	1.00	Slope	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.75	Depth to saturated zone	0.86
W:							
Water	100	Not rated		Not rated		Not rated	

Table 14.—Construction Materials, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
1B, 1C:					
Allegheny	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
2A:					
Atkins	75	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
3D, 3E, 3F:					
Berks	75	Fair		Poor	
		Bottom layer	0.12	Bottom layer	0.00
		Thickest layer	0.12	Thickest layer	0.00
4D, 4E:					
Bland	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5B:					
Botetourt	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
6D:					
Calvin	85	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.38	Thickest layer	0.00
6E, 6F:					
Calvin	80	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.38	Thickest layer	0.00
7A:					
Clubcaf	85	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
8D:					
Dekalb	80	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.30	Bottom layer	0.03
8E:					
Dekalb	85	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.30	Bottom layer	0.03

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
9F:					
Drypond-------------	45	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.45	Thickest layer	0.00
Rock outcrop--------	30	Not rated		Not rated	
10F:					
Drypond-------------	75	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.45	Thickest layer	0.00
11B:					
Ebbing--------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
12C, 12D, 12E:					
Edneytown-----------	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.11
13C, 13D, 13E:					
Elliber-------------	80	Fair		Poor	
		Bottom layer	0.05	Bottom layer	0.00
		Thickest layer	0.05	Thickest layer	0.00
14B, 14C:					
Ernest--------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
15C, 15D, 15E:					
Faywood-------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
16B:					
Frederick-----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
16C, 16D, 16E:					
Frederick-----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
17C, 17D:					
Frederick-----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
17E:					
Frederick-----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
18D:					
Greenlee------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
19C, 19E:					
Hagerstown----------	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop--------	30	Not rated		Not rated	
20C, 20D, 20E:					
Hagerstown----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
21D:					
Hagerstown----------	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop--------	30	Not rated		Not rated	
22C, 22D:					
Hagerstown----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
23C:					
Hayter--------------	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
23D:					
Hayter--------------	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
24B:					
Ingledove-----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
25C, 25D, 25E:					
Konnarock-----------	80	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.10	Thickest layer	0.00
26B, 26C, 26D, 26E:					
Lily----------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
27D, 27E:					
Litz----------------	80	Fair		Poor	
		Thickest layer	0.12	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
27F:					
Litz	65	Fair		Poor	
		Thickest layer	0.12	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
28C, 28D:					
Litz	50	Fair		Poor	
		Thickest layer	0.12	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
Groseclose	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
28E:					
Litz	45	Fair		Poor	
		Thickest layer	0.12	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
Groseclose	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
29A:					
Lobdell	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
30C, 30D, 30E:					
Macove	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
31C, 31D, 31E:					
Macove	75	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
32A:					
Maurertown	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
33A:					
Mongle	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
34B, 34C:					
Monongahela	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
35C, 35D, 35E:					
Pigeonroost	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
36F:					
Rock outcrop	40	Not rated		Not rated	
Opequon	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
37B, 37C, 37D:					
Shottower	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
38A:					
Sindion	85	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
39A:					
Speedwell	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
40B, 40C, 40D:					
Tate	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
41B, 42C:					
Timberville	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Marbie	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
43B, 43C, 43D, 44B, 44C, 44D, 44E:					
Tumbling	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
45:					
Udorthents	70	Not rated		Not rated	
46:					
Udorthents	95	Not rated		Not rated	
47:					
Udorthents	40	Not rated		Not rated	
Urban land	35	Not rated		Not rated	
48:					
Urban land	85	Not rated		Not rated	
49C, 49D, 49E:					
Watahala	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
50D, 50E, 50F:					
Weikert	85	Fair		Poor	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.45	Thickest layer	0.00
51C, 51D, 51E, 51F:					
Westmoreland	85	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00
52D, 52E, 52F:					
Westmoreland	45	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00
Rock outcrop	30	Not rated		Not rated	
53B:					
Wheeling	80	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
54A:					
Wolfgap	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
55B, 55C, 55D:					
Wyrick	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Marbie	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
W:					
Water	100	Not rated		Not rated	

Table 14.—Construction Materials, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
1B:							
Allegheny-----	85	Fair		Good		Poor	
		Low content of organic matter	0.12			Rock fragments	0.00
		Too acid	0.61			Hard to reclaim (rock fragments)	0.32
						Too acid	0.99
1C:							
Allegheny-----	85	Fair		Good		Poor	
		Low content of organic matter	0.12			Rock fragments	0.00
		Too acid	0.61			Hard to reclaim (rock fragments)	0.32
						Slope	0.84
2A:							
Atkins--------	75	Fair		Poor		Poor	
		Low content of organic matter	0.50	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too acid	0.61			Hard to reclaim (rock fragments)	0.84
						Too acid	0.99
3D:							
Berks---------	75	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Low content of organic matter	0.12			Slope	0.00
		Too acid	0.50			Too acid	0.76
3E, 3F:							
Berks---------	75	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.00	Rock fragments	0.00
		Too acid	0.50			Too acid	0.76
4D:							
Bland---------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.05	Low strength	0.00	Too clayey	0.00
		Depth to bedrock	0.10	Slope	0.50	Depth to bedrock	0.10
4E:							
Bland---------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.05	Slope	0.00	Too clayey	0.00
		Depth to bedrock	0.10	Low strength	0.00	Depth to bedrock	0.10
5B:							
Botetourt-----	80	Fair		Poor		Fair	
		Too acid	0.84	Low strength	0.00	Depth to saturated zone	0.14
				Depth to saturated zone	0.14	Hard to reclaim (rock fragments)	0.98

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
6D:							
Calvin--------	85	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to bedrock	0.00	Rock fragments	0.00
						Slope	0.00
		Droughty	0.30			Depth to bedrock	0.46
		Depth to bedrock	0.46				
6E, 6F:							
Calvin--------	80	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.00
				Slope	0.00	Rock fragments	0.00
		Droughty	0.30			Depth to bedrock	0.46
		Depth to bedrock	0.46				
7A:							
Clubcaf-------	85	Fair		Poor		Poor	
		Water erosion	0.68	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too acid	0.99				
						Hard to reclaim (rock fragments)	0.00
8D:							
Dekalb--------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.00	Slope	0.50	Rock fragments	0.00
						Depth to bedrock	0.46
		Depth to bedrock	0.46				
8E:							
Dekalb--------	85	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.00	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.46
		Depth to bedrock	0.46				
9F:							
Drypond-------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.00			Depth to bedrock	0.00
Rock outcrop--	30	Not rated		Not rated		Not rated	
10F:							
Drypond-------	75	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.00			Depth to bedrock	0.00
11B:							
Ebbing--------	90	Fair		Fair		Fair	
		Too acid	0.74	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.82				
				Low strength	0.78		

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
12C:							
Edneytown-----	85	Fair		Good		Fair	
		Low content of organic matter	0.12			Slope	0.63
		Too acid	0.50			Too acid	0.95
		Water erosion	0.68				
12D:							
Edneytown-----	85	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.50	Slope	0.00
		Too acid	0.50			Too acid	0.95
		Water erosion	0.68				
12E:							
Edneytown-----	85	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50			Too acid	0.95
		Water erosion	0.68				
13C:							
Elliber-------	80	Fair		Good		Poor	
		Low content of organic matter	0.12			Hard to reclaim (rock fragments)	0.00
		Too acid	0.50			Rock fragments	0.00
		Droughty	0.61			Too acid	0.12
13D:							
Elliber-------	80	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.50	Slope	0.00
						Hard to reclaim (rock fragments)	0.00
		Too acid	0.50				
		Droughty	0.61			Rock fragments	0.00
13E:							
Elliber-------	80	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
						Hard to reclaim (rock fragments)	0.00
		Too acid	0.50				
		Droughty	0.61			Rock fragments	0.00
14B:							
Ernest--------	85	Fair		Poor		Fair	
		Low content of organic matter	0.12	Depth to cemented pan	0.00	Depth to saturated zone	0.14
		Depth to cemented pan	0.54	Depth to saturated zone	0.14	Depth to cemented pan	0.54
		Too acid	0.61	Low strength	0.22	Too acid	0.99
14C:							
Ernest--------	85	Fair		Poor		Fair	
		Low content of organic matter	0.12	Depth to cemented pan	0.00	Depth to saturated zone	0.14
		Depth to cemented pan	0.54	Depth to saturated zone	0.14	Depth to cemented pan	0.54
		Too acid	0.61	Low strength	0.22	Slope	0.63

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
15C:							
Faywood-------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Low strength	0.00	Depth to bedrock	0.35
				Shrink-swell	0.87	Slope	0.63
		Depth to bedrock	0.35				
15D:							
Faywood-------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
				Slope	0.50	Depth to bedrock	0.35
		Depth to bedrock	0.35				
15E:							
Faywood-------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.00	Too clayey	0.00
				Low strength	0.00	Depth to bedrock	0.35
		Depth to bedrock	0.35				
16B:							
Frederick-----	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87	Too acid	0.99
		Too acid	0.61				
16C:							
Frederick-----	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87	Slope	0.63
						Too acid	0.99
		Too acid	0.61				
16D:							
Frederick-----	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Too clayey	0.00
				Shrink-swell	0.87	Too acid	0.99
		Too acid	0.61				
16E:							
Frederick-----	80	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.87	Too acid	0.99
		Too acid	0.61				
17C:							
Frederick-----	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87	Slope	0.63
						Too acid	0.99
		Too acid	0.61				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
17D:							
Frederick-----	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Too clayey	0.00
		Too acid	0.61	Shrink-swell	0.87	Too acid	0.99
17E:							
Frederick-----	80	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
		Too acid	0.61	Shrink-swell	0.87	Too acid	0.99
18D:							
Greenlee------	85	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.12	Slope	0.32	Rock fragments	0.00
		Droughty	0.98			Slope	0.00
19C:							
Hagerstown----	45	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Depth to bedrock	0.58	Slope	0.96
		Too acid	0.61	Shrink-swell	0.87		
Rock outcrop--	30	Not rated		Not rated		Not rated	
19E:							
Hagerstown----	45	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.00	Too clayey	0.00
		Too acid	0.61	Depth to bedrock	0.58		
Rock outcrop--	30	Not rated		Not rated		Not rated	
20C:							
Hagerstown----	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Depth to bedrock	0.58	Slope	0.63
		Too acid	0.61	Shrink-swell	0.87		
20D:							
Hagerstown----	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Too clayey	0.00
		Too acid	0.61	Depth to bedrock	0.58		
20E:							
Hagerstown----	80	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
		Too acid	0.61	Depth to bedrock	0.58		

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
21D:							
Hagerstown----	45	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
				Depth to bedrock	0.58		
		Too acid	0.61				
Rock outcrop--	30	Not rated		Not rated		Not rated	
22C:							
Hagerstown----	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Depth to bedrock	0.58	Slope	0.63
				Shrink-swell	0.87		
		Too acid	0.61				
22D:							
Hagerstown----	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Too clayey	0.00
				Depth to bedrock	0.58		
		Too acid	0.61				
23C:							
Hayter--------	75	Fair		Good		Fair	
		Low content of organic matter	0.50			Slope	0.63
						Rock fragments	0.76
		Too acid	0.84				
23D:							
Hayter--------	70	Fair		Fair		Poor	
		Low content of organic matter	0.50	Slope	0.50	Slope	0.00
						Rock fragments	0.76
		Too acid	0.84				
24B:							
Ingledove-----	80	Fair		Good		Good	
		Too acid	0.88				
25C:							
Konnarock-----	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.05			Depth to bedrock	0.05
		Low content of organic matter	0.50			Slope	0.63
25D:							
Konnarock-----	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.05	Slope	0.50	Rock fragments	0.00
		Low content of organic matter	0.50			Depth to bedrock	0.05
25E:							
Konnarock-----	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.05	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.50			Depth to bedrock	0.05

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
26B:							
Lily----------	80	Poor		Poor		Fair	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.10
		Depth to bedrock	0.10			Too acid	0.59
		Low content of organic matter	0.12			Rock fragments	0.76
26C:							
Lily----------	80	Poor		Poor		Fair	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.10
		Depth to bedrock	0.10			Too acid	0.59
		Low content of organic matter	0.12			Slope	0.63
26D:							
Lily----------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.10	Slope	0.50	Depth to bedrock	0.10
		Low content of organic matter	0.12			Too acid	0.59
26E:							
Lily----------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.10	Slope	0.00	Depth to bedrock	0.10
		Low content of organic matter	0.12			Too acid	0.59
27D:							
Litz----------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Rock fragments	0.00
						Depth to bedrock	0.90
		Too acid	0.50				
27E:							
Litz----------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.90
		Too acid	0.50				
27F:							
Litz----------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.90
		Too acid	0.50				
28C:							
Litz----------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Low content of organic matter	0.12			Slope	0.63
						Depth to bedrock	0.90
		Too acid	0.50				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
28C:							
Groseclose----	30	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.34	Slope	0.37
						Too acid	0.76
		Too acid	0.20				
28D:							
Litz----------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Rock fragments	0.00
						Depth to bedrock	0.90
		Too acid	0.50				
Groseclose----	30	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.12	Shrink-swell	0.34	Too clayey	0.00
				Slope	0.50	Too acid	0.76
		Too acid	0.20				
28E:							
Litz----------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.90
		Too acid	0.50				
Groseclose----	30	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.34	Too acid	0.76
		Too acid	0.20				
29A:							
Lobdell-------	75	Fair		Fair		Fair	
		Low content of organic matter	0.50	Depth to saturated zone	0.53	Depth to saturated zone	0.53
		Too acid	0.84				
		Water erosion	0.99				
30C:							
Macove--------	85	Poor		Poor		Poor	
		Stone content	0.00	Stone content	0.00	Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.12	Cobble content	0.26		
						Rock fragments	0.00
		Too acid	0.50			Slope	0.63
30D:							
Macove--------	85	Poor		Poor		Poor	
		Stone content	0.00	Stone content	0.00	Slope	0.00
		Low content of organic matter	0.12	Cobble content	0.26	Hard to reclaim (rock fragments)	0.00
				Slope	0.50		
		Too acid	0.50			Rock fragments	0.00
30E:							
Macove--------	85	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12	Stone content	0.00	Hard to reclaim (rock fragments)	0.00
				Cobble content	0.26		
		Too acid	0.50			Rock fragments	0.00

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
31C:							
Macove	75	Fair		Good		Poor	
		Low content of organic matter	0.12			Rock fragments	0.00
		Too acid	0.50			Hard to reclaim (rock fragments)	0.00
						Slope	0.63
31D:							
Macove	75	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.50	Slope	0.00
		Too acid	0.50			Rock fragments	0.00
						Hard to reclaim (rock fragments)	0.00
31E:							
Macove	75	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50			Rock fragments	0.00
						Hard to reclaim (rock fragments)	0.00
32A:							
Maurertown	80	Fair		Poor		Poor	
		Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.01
		Water erosion	0.99	Shrink-swell	0.12		
33A:							
Mongle	80	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too acid	0.68			Hard to reclaim (rock fragments)	0.50
		Water erosion	0.99			Rock fragments	0.50
34B:							
Monongahela	85	Fair		Poor		Fair	
		Low content of organic matter	0.12	Depth to cemented pan	0.00	Depth to saturated zone	0.14
		Depth to cemented pan	0.29	Depth to saturated zone	0.14	Depth to cemented pan	0.29
		Too acid	0.50	Low strength	0.78	Too acid	0.95
34C:							
Monongahela	85	Fair		Poor		Fair	
		Low content of organic matter	0.12	Depth to cemented pan	0.00	Depth to saturated zone	0.14
		Depth to cemented pan	0.29	Depth to saturated zone	0.14	Depth to cemented pan	0.29
		Too acid	0.50	Low strength	0.78	Slope	0.63
35C:							
Pigeonroost	80	Fair		Poor		Fair	
		Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.37
		Too acid	0.50			Rock fragments	0.76
		Depth to bedrock	0.93			Depth to bedrock	0.93

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
35D:							
Pigeonroost---	80	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.50	Rock fragments	0.76
		Depth to bedrock	0.93			Depth to bedrock	0.93
35E:							
Pigeonroost---	80	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.76
		Depth to bedrock	0.93			Depth to bedrock	0.93
36F:							
Rock outcrop--	40	Not rated		Not rated		Not rated	
Opequon-------	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Too acid	0.99	Low strength	0.00	Rock fragments	0.68
37B:							
Shottower-----	85	Fair		Fair		Fair	
		Too clayey	0.02	Shrink-swell	0.87	Too clayey	0.01
		Low content of organic matter	0.12			Hard to reclaim (rock fragments)	0.08
		Too acid	0.50			Too acid	0.95
37C:							
Shottower-----	85	Fair		Fair		Fair	
		Too clayey	0.02	Shrink-swell	0.87	Too clayey	0.01
		Low content of organic matter	0.12			Hard to reclaim (rock fragments)	0.08
		Too acid	0.50			Slope	0.37
37D:							
Shottower-----	85	Fair		Fair		Poor	
		Too clayey	0.02	Slope	0.50	Slope	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87	Too clayey	0.01
		Too acid	0.50			Hard to reclaim (rock fragments)	0.08
38A:							
Sindion-------	85	Good		Poor		Fair	
				Low strength	0.00	Depth to saturated zone	0.14
				Depth to saturated zone	0.14		
39A:							
Speedwell-----	85	Fair		Good		Good	
		Water erosion	0.99				
40B:							
Tate----------	80	Fair		Fair		Fair	
		Low content of organic matter	0.50	Low strength	0.78	Rock fragments	0.76
		Too acid	0.84				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
40C:							
Tate	80	Fair		Fair		Fair	
		Low content of organic matter	0.50	Low strength	0.78	Slope	0.63
		Too acid	0.84			Rock fragments	0.76
40D:							
Tate	80	Fair		Fair		Poor	
		Low content of organic matter	0.50	Slope	0.50	Slope	0.00
		Too acid	0.84	Low strength	0.78	Rock fragments	0.76
41B:							
Timberville	45	Fair		Good		Good	
		Too acid	0.20				
		Low content of organic matter	0.88				
		Water erosion	0.90				
Marbie	35	Poor		Poor		Poor	
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Hard to reclaim (dense layer)	0.00
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to cemented pan	0.00
		Droughty	0.14	Shrink-swell	0.87	Depth to saturated zone	0.53
42C:							
Timberville	45	Fair		Good		Fair	
		Too acid	0.20			Slope	0.84
		Low content of organic matter	0.88				
		Water erosion	0.90				
Marbie	35	Poor		Poor		Poor	
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Hard to reclaim (dense layer)	0.00
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to cemented pan	0.00
		Droughty	0.14	Shrink-swell	0.87	Depth to saturated zone	0.53
43B:							
Tumbling	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Too clayey	0.00
		Low content of organic matter	0.02			Hard to reclaim (rock fragments)	0.00
		Too acid	0.61			Rock fragments	0.98
43C:							
Tumbling	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Too clayey	0.00
		Low content of organic matter	0.02			Hard to reclaim (rock fragments)	0.00
		Too acid	0.61			Slope	0.63

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
43D:							
Tumbling------	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Slope	0.00
		Low content of organic matter	0.02	Slope	0.50	Too clayey	0.00
						Hard to reclaim (rock fragments)	0.00
		Too acid	0.61				
44B:							
Tumbling------	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Too clayey	0.00
		Low content of organic matter	0.02			Hard to reclaim (rock fragments)	0.00
		Too acid	0.61			Rock fragments	0.98
44C:							
Tumbling------	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Too clayey	0.00
		Low content of organic matter	0.02			Hard to reclaim (rock fragments)	0.00
		Too acid	0.61			Slope	0.63
44D:							
Tumbling------	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Slope	0.00
		Low content of organic matter	0.02	Slope	0.50	Too clayey	0.00
						Hard to reclaim (rock fragments)	0.00
		Too acid	0.61				
44E:							
Tumbling------	85	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.02	Low strength	0.10	Too clayey	0.00
						Hard to reclaim (rock fragments)	0.00
		Too acid	0.61				
45:							
Udorthents----	70	Not rated		Not rated		Not rated	
46:							
Udorthents----	95	Not rated		Not rated		Not rated	
47:							
Udorthents----	40	Not rated		Not rated		Not rated	
Urban land----	35	Not rated		Not rated		Not rated	
48:							
Urban land----	85	Not rated		Not rated		Not rated	
49C:							
Watahala------	85	Fair		Good		Poor	
		Droughty	0.08			Rock fragments	0.00
		Low content of organic matter	0.18			Too acid	0.50
						Slope	0.63
		Too acid	0.50				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
49D:							
Watahala------	85	Fair		Fair		Poor	
		Droughty	0.08	Slope	0.50	Slope	0.00
		Low content of organic matter	0.18			Rock fragments	0.00
		Too acid	0.50			Too acid	0.50
49E:							
Watahala------	85	Fair		Poor		Poor	
		Droughty	0.08	Slope	0.00	Slope	0.00
		Low content of organic matter	0.18			Rock fragments	0.00
		Too acid	0.50			Too acid	0.50
50D:							
Weikert-------	85	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.50	Rock fragments	0.00
		Low content of organic matter	0.12			Depth to bedrock	0.00
50E, 50F:							
Weikert-------	85	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.12			Depth to bedrock	0.00
51C:							
Westmoreland--	85	Fair		Fair		Poor	
		Low content of organic matter	0.12	Depth to bedrock	0.68	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50			Slope	0.63
		Droughty	0.82			Rock fragments	0.68
51D:							
Westmoreland--	85	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.50	Slope	0.00
				Depth to bedrock	0.68	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50				
		Droughty	0.82			Rock fragments	0.68
51E, 51F:							
Westmoreland--	85	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
				Depth to bedrock	0.68	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50				
		Droughty	0.82			Rock fragments	0.68
52D:							
Westmoreland--	45	Fair		Fair		Poor	
		Low content of organic matter	0.12	Depth to bedrock	0.68	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50			Slope	0.00
		Droughty	0.82			Rock fragments	0.68
Rock outcrop--	30	Not rated		Not rated		Not rated	

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
52E, 52F:							
Westmoreland--	45	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.68	Hard to reclaim (rock fragments)	0.00
		Droughty	0.82			Rock fragments	0.68
Rock outcrop--	30	Not rated		Not rated		Not rated	
53B:							
Wheeling------	80	Fair		Good		Fair	
		Too acid	0.46			Too acid	0.95
		Water erosion	0.99				
54A:							
Wolfgap-------	85	Good		Good		Good	
55B:							
Wyrick--------	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.94	Too acid	0.76
		Too acid	0.50				
Marbie--------	30	Poor		Poor		Poor	
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Hard to reclaim (dense layer)	0.00
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to cemented pan	0.00
		Droughty	0.14	Shrink-swell	0.87	Depth to saturated zone	0.53
55C:							
Wyrick--------	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.94	Slope	0.63
		Too acid	0.50			Too acid	0.76
Marbie--------	30	Poor		Poor		Poor	
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Hard to reclaim (dense layer)	0.00
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to cemented pan	0.00
		Droughty	0.14	Shrink-swell	0.87	Depth to saturated zone	0.53
55D:							
Wyrick--------	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Too clayey	0.00
		Too acid	0.50	Shrink-swell	0.94	Too acid	0.76

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
55D:							
Marbie--------	30	Poor		Poor		Poor	
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Slope	0.00
		Low content of organic matter	0.12	Slope	0.50	Hard to reclaim (dense layer)	0.00
		Droughty	0.14	Depth to saturated zone	0.53	Depth to cemented pan	0.00
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 15.—Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1B, 1C:							
Allegheny-----	85	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			No ground water	1.00
2A:							
Atkins--------	75	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Cutbanks cave	1.00
				Depth to saturated zone	1.00		
				Piping	1.00		
3D:							
Berks---------	75	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	No ground water	1.00
		Depth to bedrock	0.66	Seepage	0.12		
		Slope	0.03				
3E:							
Berks---------	75	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	No ground water	1.00
		Slope	0.88	Seepage	0.12		
		Depth to bedrock	0.66				
3F:							
Berks---------	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.66	No ground water	1.00
		Seepage	1.00	Seepage	0.12		
		Depth to bedrock	0.66				
4D:							
Bland---------	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.98	Thin layer	0.98	No ground water	1.00
		Slope	0.12	Hard to pack	0.41		
		Seepage	0.03				
4E:							
Bland---------	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.98	Thin layer	0.98	No ground water	1.00
		Slope	0.82	Hard to pack	0.41		
		Seepage	0.03				
5B:							
Botetourt-----	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	0.99		
				Seepage	0.01		
6D:							
Calvin--------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No ground water	1.00
		Depth to bedrock	0.88	Seepage	0.38		
		Slope	0.03				

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
6E:							
Calvin--------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No ground water	1.00
		Depth to bedrock	0.88	Seepage	0.38		
		Slope	0.72				
6F:							
Calvin--------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No ground water	1.00
		Slope	1.00	Seepage	0.38		
		Depth to bedrock	0.88				
7A:							
Clubcaf-------	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Ponding	1.00	Cutbanks cave	1.00
				Depth to saturated zone	1.00	Slow refill	0.30
				Piping	1.00		
8D:							
Dekalb--------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No ground water	1.00
		Depth to bedrock	0.88	Seepage	0.30		
		Slope	0.12				
8E:							
Dekalb--------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.88	No ground water	1.00
		Slope	0.94	Seepage	0.30		
		Depth to bedrock	0.88				
9F:							
Drypond-------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No ground water	1.00
		Slope	1.00	Seepage	0.45		
Rock outcrop--	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	1.00				
10F:							
Drypond-------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	1.00	Seepage	0.45		
11B:							
Ebbing--------	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	0.99		
12C:							
Edneytown-----	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.11	No ground water	1.00
		Slope	0.01				
12D:							
Edneytown-----	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.11	No ground water	1.00
		Slope	0.12				

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12E:							
Edneytown-----	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.11	No ground water	1.00
		Slope	0.50				
13C:							
Elliber-------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.05	No ground water	1.00
		Slope	0.01				
13D:							
Elliber-------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.05	No ground water	1.00
		Slope	0.12				
13E:							
Elliber-------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.05	No ground water	1.00
		Slope	0.97				
14B:							
Ernest--------	85	Somewhat limited		Very limited		Very limited	
		Depth to cemented pan	0.86	Depth to saturated zone	1.00	No ground water	1.00
		Seepage	0.70	Piping	1.00		
				Thin layer	0.86		
14C:							
Ernest--------	85	Somewhat limited		Very limited		Very limited	
		Depth to cemented pan	0.86	Depth to saturated zone	1.00	No ground water	1.00
		Seepage	0.70	Piping	1.00		
		Slope	0.01	Thin layer	0.86		
15C:							
Faywood-------	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.91	Thin layer	0.91	No ground water	1.00
		Seepage	0.02	Hard to pack	0.01		
		Slope	0.01				
15D:							
Faywood-------	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.91	Thin layer	0.91	No ground water	1.00
		Slope	0.12	Hard to pack	0.01		
		Seepage	0.02				
15E:							
Faywood-------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.94	Thin layer	0.91	No ground water	1.00
		Depth to bedrock	0.91	Hard to pack	0.01		
		Seepage	0.02				
16B:							
Frederick-----	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.14	No ground water	1.00
16C:							
Frederick-----	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.14	No ground water	1.00
		Slope	0.01				

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
16D:							
Frederick-----	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.14	No ground water	1.00
		Slope	0.12				
16E:							
Frederick-----	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Hard to pack	0.14	No ground water	1.00
		Seepage	0.70				
17C:							
Frederick-----	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.12	No ground water	1.00
		Slope	0.01				
17D:							
Frederick-----	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Hard to pack	0.12	No ground water	1.00
		Slope	0.12				
17E:							
Frederick-----	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Hard to pack	0.12	No ground water	1.00
		Seepage	0.70				
18D:							
Greenlee------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	0.99	No ground water	1.00
		Slope	0.15				
				Seepage	0.03		
19C:							
Hagerstown----	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.11	No ground water	1.00
		Depth to bedrock	0.10	Hard to pack	0.04		
Rock outcrop--	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
19E:							
Hagerstown----	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.11	No ground water	1.00
		Slope	0.50	Hard to pack	0.04		
		Depth to bedrock	0.10				
Rock outcrop--	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.50				
20C:							
Hagerstown----	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.11	No ground water	1.00
		Depth to bedrock	0.10	Hard to pack	0.04		
		Slope	0.01				
20D:							
Hagerstown----	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.11	No ground water	1.00
		Slope	0.12	Hard to pack	0.04		
		Depth to bedrock	0.10				

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
20E:							
Hagerstown----	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Thin layer	0.11	No ground water	1.00
		Seepage	0.70	Hard to pack	0.04		
		Depth to bedrock	0.10				
21D:							
Hagerstown----	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.11	No ground water	1.00
		Slope	0.36	Hard to pack	0.04		
		Depth to bedrock	0.10				
Rock outcrop--	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.36				
22C:							
Hagerstown----	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.11	No ground water	1.00
		Depth to bedrock	0.10	Hard to pack	0.04		
		Slope	0.01				
22D:							
Hagerstown----	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.11	No ground water	1.00
		Slope	0.12	Hard to pack	0.04		
		Depth to bedrock	0.10				
23C:							
Hayter--------	75	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
		Slope	0.01				
23D:							
Hayter--------	70	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
		Slope	0.12				
24B:							
Ingledove-----	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.99	No ground water	1.00
25C:							
Konnarock-----	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	No ground water	1.00
		Depth to bedrock	0.99	Seepage	0.10		
		Slope	0.01				
25D:							
Konnarock-----	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	No ground water	1.00
		Depth to bedrock	0.99	Seepage	0.10		
		Slope	0.12				
25E:							
Konnarock-----	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	No ground water	1.00
		Slope	0.99	Seepage	0.10		
		Depth to bedrock	0.99				

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
26B:							
Lily----------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	0.99	No ground water	1.00
		Depth to bedrock	0.98	Thin layer	0.98		
26C:							
Lily----------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	0.99	No ground water	1.00
		Depth to bedrock	0.98	Thin layer	0.98		
		Slope	0.01				
26D:							
Lily----------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	0.99	No ground water	1.00
		Depth to bedrock	0.98	Thin layer	0.98		
		Slope	0.12				
26E:							
Lily----------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	0.99	No ground water	1.00
		Depth to bedrock	0.98	Thin layer	0.98		
		Slope	0.97				
27D:							
Litz----------	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.70	No ground water	1.00
		Depth to bedrock	0.69	Seepage	0.12		
		Slope	0.12				
27E:							
Litz----------	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.82	Thin layer	0.70	No ground water	1.00
		Seepage	0.70	Seepage	0.12		
		Depth to bedrock	0.69				
27F:							
Litz----------	65	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.70	No ground water	1.00
		Seepage	0.70	Seepage	0.12		
		Depth to bedrock	0.69				
28C:							
Litz----------	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.70	No ground water	1.00
		Depth to bedrock	0.69	Seepage	0.12		
		Slope	0.01				
Groseclose----	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.01	Hard to pack	0.04	No ground water	1.00
28D:							
Litz----------	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.70	No ground water	1.00
		Depth to bedrock	0.69	Seepage	0.12		
		Slope	0.12				
Groseclose----	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.12	Hard to pack	0.04	No ground water	1.00

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
28E:							
Litz----------	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Thin layer	0.70	No ground water	1.00
		Seepage	0.70	Seepage	0.12		
		Depth to bedrock	0.69				
Groseclose----	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.97	Hard to pack	0.04	No ground water	1.00
29A:							
Lobdell-------	75	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Piping	1.00	Cutbanks cave	0.10
				Depth to saturated zone	0.99	Depth to water	0.01
30C:							
Macove--------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	No ground water	1.00
		Slope	0.01				
				Piping	1.00		
30D:							
Macove--------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	No ground water	1.00
		Slope	0.12				
				Piping	1.00		
30E:							
Macove--------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	No ground water	1.00
		Slope	0.82				
				Piping	1.00		
31C:							
Macove--------	75	Very limited		Not limited		Very limited	
		Seepage	1.00			No ground water	1.00
		Slope	0.01				
31D:							
Macove--------	75	Very limited		Not limited		Very limited	
		Seepage	1.00			No ground water	1.00
		Slope	0.12				
31E:							
Macove--------	75	Very limited		Not limited		Very limited	
		Seepage	1.00			No ground water	1.00
		Slope	0.82				
32A:							
Maurertown----	80	Not limited		Very limited		Somewhat limited	
				Ponding	1.00	Slow refill	0.30
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Hard to pack	0.01		
33A:							
Mongle--------	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	1.00		

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
34B:							
Monongahela---	85	Somewhat limited		Very limited		Very limited	
		Depth to cemented pan	0.93	Depth to saturated zone	1.00	No ground water	1.00
		Seepage	0.70	Piping	1.00		
				Thin layer	0.93		
34C:							
Monongahela---	85	Somewhat limited		Very limited		Very limited	
		Depth to cemented pan	0.93	Depth to saturated zone	1.00	No ground water	1.00
		Seepage	0.70	Piping	1.00		
		Slope	0.01	Thin layer	0.93		
35C:							
Pigeonroost---	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	No ground water	1.00
		Depth to bedrock	0.03	Thin layer	0.66		
		Slope	0.01				
35D:							
Pigeonroost---	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	No ground water	1.00
		Slope	0.12	Thin layer	0.66		
		Depth to bedrock	0.03				
35E:							
Pigeonroost---	80	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	No ground water	1.00
		Seepage	0.70	Thin layer	0.66		
		Depth to bedrock	0.03				
36F:							
Rock outcrop--	40	Very limited		Not rated		Not rated	
		Slope	1.00				
		Depth to bedrock	1.00				
Opequon-------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	1.00	Hard to pack	0.09		
37B:							
Shottower-----	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.22	No ground water	1.00
37C:							
Shottower-----	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.22	No ground water	1.00
		Slope	0.01				
37D:							
Shottower-----	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.22	No ground water	1.00
		Slope	0.12				
38A:							
Sindion-------	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	0.98		

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
39A:							
Speedwell	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	No ground water	1.00
40B:							
Tate	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.87	No ground water	1.00
40C:							
Tate	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.87	No ground water	1.00
		Slope	0.01				
40D:							
Tate	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.87	No ground water	1.00
		Slope	0.12				
41B, 42C:							
Timberville	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
Marbie	35	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	No ground water	1.00
				Piping	1.00		
		Seepage	0.53	Depth to saturated zone	0.99		
43B:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.67	No ground water	1.00
43C:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.67	No ground water	1.00
		Slope	0.01				
43D:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.67	No ground water	1.00
		Slope	0.12				
44B:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.67	No ground water	1.00
44C:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.67	No ground water	1.00
		Slope	0.01				
44D:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.67	No ground water	1.00
		Slope	0.12				
44E:							
Tumbling	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Piping	0.67	No ground water	1.00
		Seepage	0.70				

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
45:							
Udorthents----	70	Somewhat limited		Not rated		Not rated	
		Seepage	0.11				
		Slope	0.03				
46:							
Udorthents----	95	Somewhat limited		Not rated		Not rated	
		Slope	0.28				
		Seepage	0.11				
47:							
Udorthents----	40	Somewhat limited		Not rated		Not rated	
		Seepage	0.11				
		Slope	0.03				
Urban land----	35	Somewhat limited		Not rated		Not rated	
		Slope	0.03				
48:							
Urban land----	85	Not limited		Not rated		Not rated	
49C:							
Watahala------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.01				
49D:							
Watahala------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.12				
49E:							
Watahala------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	No ground water	1.00
		Slope	0.72				
50D:							
Weikert-------	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No ground water	1.00
		Seepage	0.70	Seepage	0.45		
		Slope	0.12				
50E:							
Weikert-------	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	No ground water	1.00
		Slope	0.88	Seepage	0.45		
		Seepage	0.70				
50F:							
Weikert-------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	No ground water	1.00
		Depth to bedrock	1.00	Seepage	0.45		
		Seepage	0.70				
51C:							
Westmoreland--	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.35	No ground water	1.00
		Depth to bedrock	0.08	Thin layer	0.08		
		Slope	0.01				

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
51D:							
Westmoreland--	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.35	No ground water	1.00
		Slope	0.12	Thin layer	0.08		
		Depth to bedrock	0.08				
51E:							
Westmoreland--	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.88	Seepage	0.35	No ground water	1.00
		Seepage	0.70	Thin layer	0.08		
		Depth to bedrock	0.08				
51F:							
Westmoreland--	85	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Seepage	0.35	No ground water	1.00
		Seepage	0.70	Thin layer	0.08		
		Depth to bedrock	0.08				
52D:							
Westmoreland--	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.35	No ground water	1.00
		Depth to bedrock	0.08	Thin layer	0.08		
		Slope	0.03				
Rock outcrop--	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.03				
52E:							
Westmoreland--	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.88	Seepage	0.35	No ground water	1.00
		Seepage	0.70	Thin layer	0.08		
		Depth to bedrock	0.08				
Rock outcrop--	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.88				
52F:							
Westmoreland--	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Seepage	0.35	No ground water	1.00
		Seepage	0.70	Thin layer	0.08		
		Depth to bedrock	0.08				
Rock outcrop--	30	Very limited		Not rated		Not rated	
		Slope	1.00				
		Depth to bedrock	1.00				
53B:							
Wheeling------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	No ground water	1.00
54A:							
Wolfgap-------	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	No ground water	1.00
				Seepage	0.02		

Table 15.—Water Management—Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
55B:							
Wyrick--------	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.47	No ground water	1.00
Marbie--------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	No ground water	1.00
				Piping	1.00		
		Seepage	0.53	Depth to saturated zone	0.99		
55C:							
Wyrick--------	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.47	No ground water	1.00
		Slope	0.01				
Marbie--------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	No ground water	1.00
				Piping	1.00		
		Seepage	0.53	Depth to saturated zone	0.99		
		Slope	0.01				
55D:							
Wyrick--------	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.47	No ground water	1.00
		Slope	0.12				
Marbie--------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	No ground water	1.00
				Piping	1.00		
		Seepage	0.53	Depth to saturated zone	0.99		
		Slope	0.12				
W:							
Water---------	100	Not rated		Not rated		Not rated	

Table 16.—Engineering Properties

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1B, 1C:												
Allegheny-------	0-10	Loam	CL, CL-ML	A-4	0	0-8	85-100	80-100	70-95	50-75	21-31	6-11
	10-65	Gravelly sandy clay loam, clay loam, gravelly silt loam	SC, SC-SM, CL, CL-ML	A-6, A-2-4	0	0-7	70-100	60-100	50-100	20-90	23-39	7-16
2A:												
Atkins----------	0-4	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	80-100	75-100	65-95	45-75	21-30	6-11
	4-28	Loam, silty clay loam, sandy loam	CL, SC	A-6, A-2-4	0	0	85-100	75-100	45-100	25-95	23-39	7-16
	28-65	Gravelly loam, silty clay loam, very gravelly sandy loam	SC, SC-SM, CL, CL-ML, GP-GC, GC, GC-GM	A-4, A-6, A-2-4, A-1	0	0	45-100	25-100	15-100	5-95	16-39	3-16
3D, 3E, 3F:												
Berks-----------	0-2	Silt loam	CL, CL-ML, ML	A-4	0	0-2	80-85	75-80	70-80	55-75	16-30	2-10
	2-36	Very channery silty clay loam, extremely channery loam, channery silty clay loam	GC, GM, GC-GM, CL, CL-ML, ML, SC, SM, SC-SM	A-2-6, A-4, A-6, A-1	0	0-10	35-80	15-75	15-75	10-70	16-36	2-14
	36-46	Bedrock			---	---	---	---	---	---	---	---
4D, 4E:												
Bland-----------	0-5	Silty clay loam	CL	A-6	0	0	80-100	75-100	70-100	65-95	36-48	16-25
	5-24	Silty clay, clay	CH	A-7-6	0	0	80-100	80-100	70-100	60-95	53-66	29-39
	24-34	Bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5B:												
Botetourt-------	0-8	Loam	CL, CL-ML, ML	A-4	0	0-8	85-100	85-100	70-95	50-75	13-31	1-11
	8-49	Clay loam, cobbly loam, sandy clay loam	CL, CL-ML, SC-SM, SC	A-6, A-2-4	0	0-13	70-100	60-100	50-100	20-80	23-39	7-16
	49-65	Fine sandy loam, very cobbly sandy loam, clay loam	SC, SC-SM, CL-ML, CL	A-4, A-6, A-2-4, A-1	0	0-18	60-95	50-95	30-95	15-80	18-39	4-16
6D, 6E, 6F:												
Calvin----------	0-6	Silt loam	CL-ML, CL, ML	A-4	0	0-2	80-95	75-95	70-90	50-80	16-30	3-11
	6-21	Channery silt loam, very channery loam	SC-SM, SC, SM	A-4, A-2-4, A-1	0	0-10	50-70	30-65	30-60	20-55	16-30	3-11
	21-29	Extremely channery silt loam, very channery silt loam, extremely channery loam	GC-GM, GC	A-2-4, A-1, A-4	0	0-10	35-55	10-45	10-45	10-40	16-30	3-11
	29-39	Bedrock			---	---	---	---	---	---	---	---
7A:												
Clubcaf---------	0-10	Silt loam	CL, CL-ML	A-4	0	0	95-100	90-100	80-100	65-90	18-25	4-8
	10-25	Loam, silt loam	CL, CL-ML	A-4	0	0	95-100	90-100	80-100	55-90	18-25	4-8
	25-41	Loam, silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	55-95	23-39	7-16
	41-65	Very gravelly loam, silty clay loam, very gravelly loamy sand	SC, SC-SM, CL, CL-ML, GP-GC, GC	A-2-4, A-6	0	0	45-100	30-100	15-100	5-95	20-39	5-16

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
8D, 8E:												
Dekalb----------	0-2	Channery loam	SC-SM, SM, SC	A-4	0	0-5	65-80	55-70	45-70	30-55	13-30	1-11
	2-21	Channery loam, very channery fine sandy loam	SC-SM, SM, SC, GM, GC, GC-GM	A-4, A-2-4, A-1	0	0-10	45-75	30-65	20-65	10-50	12-25	1-8
	21-29	Extremely channery sandy loam, very channery sandy loam, extremely channery loamy sand	GW-GM, GW	A-1	0	0-15	30-50	5-30	5-25	1-15	12-21	1-6
	29-39	Bedrock			---	---	---	---	---	---	---	---
9F:												
Drypond---------	0-3	Channery loam	SC-SM, SM	A-4, A-2-4	0	0-2	60-80	50-75	45-70	30-55	13-25	NP-7
	3-12	Channery loam, channery sandy clay loam, extremely channery sandy loam	SC-SM, SM, SC, GW-GM, GW-GC	A-4, A-2-4, A-1	0	0-10	30-70	15-60	10-55	5-45	13-27	NP-8
	12-19	Extremely channery loam, very channery loam, extremely channery sandy loam	GW-GM, GW	A-1	0	0-10	25-50	5-35	5-35	2-25	12-23	NP-6
	19-29	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
10F:												
Drypond---------	0-3	Channery loam	SC-SM, SM	A-4, A-2-4	0	0-2	60-80	50-75	45-70	30-55	13-25	NP-7
	3-12	Channery loam, channery sandy clay loam, extremely channery sandy loam	SC-SM, SM, SC, GW-GM, GW-GC	A-4, A-2-4, A-1	0	0-10	30-70	15-60	10-55	5-45	13-27	NP-8
	12-19	Extremely channery loam, very channery loam, extremely channery sandy loam	GW-GM, GW	A-1	0	0-10	25-50	5-35	5-35	2-25	12-23	NP-6
	19-29	Bedrock			---	---	---	---	---	---	---	---
11B:												
Ebbing----------	0-14	Loam	CL-ML, ML, CL, SC-SM	A-4	0	0-8	85-100	80-100	70-95	50-75	13-31	1-11
	14-45	Loam, clay loam, gravelly loam	CL, CL-ML	A-6	0	0-7	65-100	55-100	45-100	35-80	23-39	7-16
	45-65	Loam, gravelly sandy loam, clay loam	CL, CL-ML	A-6, A-2-4	0	0-14	70-95	60-90	35-90	20-70	23-39	7-16
12C, 12D, 12E:												
Edneytown-------	0-4	Loam	ML, CL-ML	A-4	0	0	80-100	80-100	65-95	45-75	12-21	1-6
	4-7	Loam, fine sandy loam, sandy loam	ML, CL-ML, SM, SC-SM	A-4, A-2-4	0	0	80-100	80-100	45-95	25-75	12-21	1-6
	7-20	Sandy clay loam, clay loam	SC, CL	A-6, A-2-4	0	0	80-100	75-100	60-100	25-80	25-39	8-16
	20-27	Sandy loam, sandy clay loam	SC, SM, SC-SM	A-2-4, A-4	0	0	80-100	75-100	45-90	25-55	16-30	3-11
	27-62	Loamy sand, fine sandy loam, loam	SC-SM, SM	A-2-4, A-1, A-4	0	0	80-100	75-100	35-85	10-55	11-21	NP-6

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
13C, 13D, 13E:												
Elliber	0-6	Very gravelly silt loam	GC-GM, GM	A-2-4, A-4, A-1	0	0	45-60	25-45	25-45	20-40	12-21	1-6
	6-20	Very gravelly silt loam, extremely gravelly loam	GM, GC-GM	A-2-4, A-1	0	0	35-55	10-40	10-40	5-35	12-21	1-6
	20-65	Very gravelly silt loam, very gravelly silty clay loam, extremely gravelly loam	GC, GC-GM	A-2-4, A-1, A-6	0	0	35-55	15-45	10-45	10-40	18-34	4-13
14B, 14C:												
Ernest	0-9	Silt loam	CL, CL-ML	A-4	0	0-2	80-100	75-100	65-100	50-90	21-25	6-8
	9-30	Silt loam, channery silt loam, silty clay loam	CL, SC	A-4, A-6	0	0-10	65-100	55-100	50-100	40-95	25-39	8-16
	30-65	Loam, very channery loam, silty clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-2-4	0	0-10	60-95	50-95	40-90	25-90	23-34	7-13
15C, 15D, 15E:												
Faywood	0-4	Silt loam	CL, CL-ML	A-4	0	0-2	85-100	80-100	70-100	55-90	21-31	6-11
	4-28	Silty clay, clay, silty clay loam	CH, CL, MH, ML	A-7	0	0-5	85-100	80-100	75-100	60-95	39-61	16-28
	28-38	Bedrock			---	---	---	---	---	---	---	---
16B, 16C, 16D, 16E:												
Frederick	0-9	Silt loam	CL, CL-ML	A-4	0	0	80-100	75-100	70-100	50-90	19-31	5-11
	9-25	Clay, silty clay, gravelly silty clay loam	MH, ML, CL, CH, SM, SC	A-7, A-6	0	0	60-100	50-100	45-100	35-95	38-61	14-28
	25-70	Silty clay, clay, gravelly silty clay	MH, CH, SM, SC	A-7	0	0	60-100	50-100	45-100	40-95	43-70	18-33

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
17C, 17D, 17E:												
Frederick-------	0-9	Very gravelly silt loam	GC, GC-GM	A-2-4, A-1, A-4	0	0	45-60	25-50	25-50	20-45	19-31	5-11
	9-25	Clay, silty clay, gravelly silty clay loam	MH, ML, CL, CH, SM, SC	A-7, A-6	0	0	60-100	50-100	45-100	35-95	38-61	14-28
	25-70	Silty clay, clay, gravelly silty clay	MH, CH, SM, SC	A-7	0	0	60-100	50-100	45-100	40-95	43-70	18-33
18D:												
Greenlee--------	0-7	Very cobbly loam	SM, SC, SC-SM, ML, CL, CL-ML	A-4	0	37-48	65-75	55-75	45-75	30-60	15-30	2-11
	7-53	Very cobbly sandy loam, very cobbly loam, very cobbly sandy clay loam	SM, SC, SC-SM, ML, CL, CL-ML	A-1, A-2-4, A-4	0	36-51	65-85	55-80	35-75	20-60	10-30	NP-11
	53-62	Extremely cobbly sandy loam, very cobbly loam, extremely cobbly sand	SM, SC-SM, SP, SP-SM, ML, CL-ML	A-1, A-2-4, A-4	0	36-65	55-85	40-80	20-75	2-60	8-23	NP-7
19C, 19E:												
Hagerstown------	0-9	Silt loam	CL, CL-ML	A-4	0	0	80-100	75-100	70-100	50-90	21-31	6-11
	9-50	Silty clay, clay	MH, ML, CH, CL	A-7	0	0	80-100	75-100	70-100	60-95	39-61	16-28
	50-60	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												
20C, 20D, 20E:												
Hagerstown------	0-9	Silt loam	CL, CL-ML	A-4	0	0	80-100	75-100	70-100	50-90	21-31	6-11
	9-50	Silty clay, clay	MH, ML, CH, CL	A-7	0	0	80-100	75-100	70-100	60-95	39-61	16-28
	50-60	Bedrock			---	---	---	---	---	---	---	---
21D:												
Hagerstown------	0-9	Silt loam	CL, CL-ML	A-4	0	0	80-100	75-100	70-100	50-90	21-31	6-11
	9-50	Silty clay, clay	MH, ML, CH, CL	A-7	0	0	80-100	75-100	70-100	60-95	39-61	16-28
	50-60	Bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
21D:												
Rock outcrop.												
22C, 22D:												
Hagerstown------	0-9	Silt loam	CL, CL-ML	A-4	0	0	80-100	75-100	70-100	50-90	21-31	6-11
	9-50	Silty clay, clay	MH, ML, CH, CL	A-7	0	0	80-100	75-100	70-100	60-95	39-61	16-28
	50-60	Bedrock			---	---	---	---	---	---	---	---
23C, 23D:												
Hayter----------	0-11	Loam	CL, ML, CL-ML	A-4	0	0-5	80-100	75-100	65-95	45-75	16-30	2-10
	11-65	Loam, clay loam, very gravelly sandy clay loam	CL, SC	A-6, A-2-4	0	0-10	60-100	45-100	35-100	15-80	23-38	6-14
24B:												
Ingledove-------	0-13	Loam	CL, CL-ML	A-4	0	0-10	85-100	80-100	70-95	50-75	21-31	6-11
	13-52	Loam, clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-10	85-100	80-100	65-100	30-80	23-39	7-16
	52-65	Clay loam, loam, very cobbly sandy clay loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-35	55-100	40-100	35-100	15-80	23-39	7-16
25C, 25D, 25E:												
Konnarock-------	0-2	Channery silt loam	CL, CL-ML, ML, SM, SC, SC-SM	A-4	0	0-2	60-80	50-75	45-75	36-65	16-30	3-11
	2-13	Very channery loam, silt loam, extremely channery loam	SC, SC-SM, GP-GC, GC, CL, CL-ML	A-2-4, A-4	0	0-10	30-95	10-90	10-90	5-80	21-30	6-11
	13-23	Very channery silt loam, extremely channery loam	GC, GC-GM	A-2-4	0	0-10	30-55	5-40	5-40	5-35	21-30	6-11
	23-33	Bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
26B, 26C, 26D, 26E:												
Lily-----------	0-5	Loam	CL, ML, CL-ML	A-4	0	0	85-100	80-100	70-95	50-75	12-30	1-11
	5-24	Loam, sandy clay loam, clay loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0	90-100	80-100	65-100	30-80	23-39	7-16
	24-34	Bedrock			---	---	---	---	---	---	---	---
27D, 27E, 27F:												
Litz------------	0-2	Silt loam	CL, CL-ML, ML	A-4	0	0-2	80-95	75-95	65-90	50-80	16-31	3-11
	2-13	Very channery silt loam, very channery silty clay loam, extremely channery loam	GC, GC-GM, GM, SM, SC, SC-SM	A-2-4, A-1, A-6	0	0-10	30-60	5-45	5-45	5-45	16-39	3-16
	13-35	Very channery silt loam, very channery silty clay loam, extremely channery loam	GC, GC-GM, GM, SM, SC, SC-SM	A-2-4, A-1, A-6	0	0-10	30-60	5-45	5-45	5-45	16-39	3-16
	35-45	Bedrock			---	---	---	---	---	---	---	---
28C, 28D, 28E:												
Litz------------	0-2	Silt loam	CL, CL-ML, ML	A-4	0	0-2	80-95	75-95	65-90	50-80	16-31	3-11
	2-13	Very channery silt loam, very channery silty clay loam, extremely channery loam	GC, GC-GM, GM, SM, SC, SC-SM	A-2-4, A-1, A-6	0	0-10	30-60	5-45	5-45	5-45	16-39	3-16
	13-35	Very channery silt loam, very channery silty clay loam, extremely channery loam	GC, GC-GM, GM, SM, SC, SC-SM	A-2-4, A-1, A-6	0	0-10	30-60	5-45	5-45	5-45	16-39	3-16
	35-45	Bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
28C, 28D, 28E:												
Groseclose------	0-6	Silt loam	CL, CL-ML, ML	A-4	0	0-2	80-100	75-100	70-100	55-90	13-31	1-11
	6-43	Clay, silty clay, silty clay loam	MH, ML, CL, CH	A-7	0	0-2	80-100	75-100	70-100	60-95	39-61	16-28
	43-65	Clay loam, silt loam, clay	CL	A-7	0	0-5	80-100	75-100	70-100	55-95	30-52	12-23
29A:												
Lobdell---------	0-9	Loam	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	55-75	21-31	6-11
	9-39	Loam, silt loam, silty clay loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4, A-6	0	0	85-100	75-100	45-100	20-95	23-34	7-13
	39-65	Loam, silt loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4, A-6	0	0	85-100	75-100	45-100	20-90	23-34	7-13
30C, 30D, 30E:												
Macove----------	0-6	Cobbly silt loam	CL-ML, CL, ML	A-4	0-15	15-25	85-90	75-90	70-90	55-80	16-30	3-11
	6-13	Cobbly silt loam, very cobbly loam	CL, CL-ML, ML	A-4, A-6	0-15	15-30	85-90	75-90	65-90	45-80	16-34	3-13
	13-65	Very stony loam, gravelly silty clay loam, extremely stony loam	CL-ML, CL, ML, SM, SC, SC-SM	A-4, A-6, A-2-4	10-35	10-35	60-90	45-90	40-90	30-85	16-34	3-13
31C, 31D, 31E:												
Macove----------	0-6	Very channery silt loam	SC-SM, SM, SC, GC, GM, GC-GM	A-2-4, A-1, A-4	0	5-20	45-60	30-50	30-50	20-45	16-30	3-11
	6-13	Channery silt loam, very channery loam	SC-SM, SC, SM, CL-ML, CL, ML	A-4	0-5	5-20	70-85	55-80	50-80	35-70	16-31	3-11
	13-65	Very channery loam, very channery silty clay loam, very cobbly silty clay loam, extremely channery loam	SC-SM, SC, SM, ML, CL, CL-ML, GM, GC, GC-GM	A-4, A-6, A-2-4, A-1	0-10	5-30	45-85	30-80	25-80	15-75	16-34	3-13

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
32A:												
Maurertown------	0-7	Silt loam	CL	A-4	0	0	100	100	90-100	70-90	23-31	7-11
	7-65	Silty clay loam, clay, clay loam	ML, MH, CL, CH	A-7	0	0	100	100	90-100	70-95	39-61	16-28
33A:												
Mongle----------	0-9	Loam	CL, CL-ML, SC-SM	A-4	0	0-8	95-100	80-100	70-95	50-75	21-31	4-10
	9-20	Loam, silty clay loam	CL	A-6, A-4	0	0-8	90-100	85-100	70-100	50-95	23-35	6-14
	20-65	Loam, silty clay loam	CL	A-6, A-4	0	0-15	95-100	90-100	75-100	55-95	23-35	6-14
34B, 34C:												
Monongahela-----	0-10	Silt loam	CL-ML, CL, ML	A-4	0	0-10	85-100	80-100	70-100	55-90	16-31	3-11
	10-27	Clay loam, silty clay loam, gravelly sandy clay loam, gravelly silt loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0-15	75-100	70-100	55-100	25-95	23-39	7-16
	27-65	Silt loam, clay loam, gravelly loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-15	70-100	60-100	50-100	35-90	23-39	7-16
35C, 35D, 35E:												
Pigeonroost-----	0-10	Loam	CL-ML, CL, ML	A-4	0	0	85-100	75-100	65-95	45-75	14-25	2-8
	10-23	Loam, sandy clay loam, clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-6	0	0	85-100	75-100	60-100	25-80	23-39	7-16
	23-36	Loam, sandy loam, fine sandy loam	CL-ML, CL, ML, SC-SM, SC, SM	A-4, A-2-4	0	0	85-100	75-100	45-95	25-75	14-25	2-8
	36-46	Bedrock			---	---	---	---	---	---	---	---
36F:												
Rock outcrop.												
Opequon---------	0-8	Silty clay loam	CL	A-6, A-7	0	0-2	80-100	75-100	70-100	65-95	36-48	16-25
	8-14	Silty clay, clay, gravelly silty clay loam	CH, SC	A-7	0	0-2	65-100	55-100	50-100	40-95	44-80	22-50
	14-24	Bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
37B, 37C, 37D:												
Shottower-------	0-8	Loam	CL, CL-ML	A-4	0	0-8	85-100	80-100	70-95	50-75	16-25	5-9
	8-29	Clay loam, clay, gravelly clay loam	CL, SC	A-6, A-7-6	0	0-7	65-100	55-100	50-100	40-95	31-49	13-22
	29-65	Gravelly clay, gravelly clay loam, clay	SC, CL	A-6, A-7-6	0	0-7	65-100	55-100	50-100	40-95	31-49	13-22
38A:												
Sindion---------	0-9	Silt loam	CL, CL-ML	A-4	0	0-3	95-100	95-100	85-100	65-90	20-31	4-10
	9-18	Loam, silt loam	CL, CL-ML	A-4	0	0-3	95-100	95-100	80-100	55-90	20-31	4-10
	18-46	Clay loam, loam, silt loam	CL, CL-ML	A-4, A-6	0	0-7	90-100	85-100	70-100	50-90	23-38	6-14
	46-65	Silty clay loam, sandy loam, silt loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-2-4	0	0-7	90-100	85-100	50-100	25-95	20-38	4-14
39A:												
Speedwell-------	0-11	Loam	CL-ML, CL	A-4	0	0-8	85-100	80-100	70-95	50-75	18-25	4-8
	11-65	Loam, silty clay loam, silt loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-6	0	0-8	85-100	80-100	65-100	30-95	23-39	7-16
40B, 40C, 40D:												
Tate------------	0-6	Loam	CL, ML, CL-ML	A-4	0	0	80-100	75-100	65-95	45-75	12-30	1-44
	6-65	Clay loam, loam, gravelly sandy clay loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4	0	0	60-100	50-100	40-100	15-80	23-39	7-16

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
41B, 42C:												
Timberville-----	0-10	Silt loam	CL, ML, CL-ML	A-4	0	0	80-100	75-100	65-100	50-90	12-30	NP-10
	10-31	Silt loam, silty clay loam, gravelly silt loam	CL, CL-ML, ML, SM, SC, SC-SM	A-4, A-6	0	0	60-100	50-100	45-100	35-95	12-34	NP-12
	31-51	Silty clay loam, silt loam, gravelly sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-6	0	0	60-100	50-100	40-100	15-95	25-43	7-17
	51-65	Silty clay loam, clay, gravelly clay loam	CL, CH, MH, ML, SC, SM	A-7	0	0	60-100	50-100	45-100	35-95	38-60	14-27
Marbie----------	0-7	Silt loam	CL, CL-ML	A-4	0	0	80-100	75-100	70-100	55-90	21-31	6-11
	7-18	Silt loam, silty clay loam, loam	CL	A-4, A-6	0	0	80-100	80-100	65-100	45-95	25-39	8-16
	18-41	Silt loam, silty clay loam, gravelly loam	CL	A-4, A-6	0	0	65-100	55-100	50-100	35-95	25-39	8-16
	41-65	Silty clay loam, clay, gravelly clay loam	CL, CH, MH, ML	A-6, A-7	0	0	70-100	65-100	60-100	45-95	30-57	11-26

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
43B, 43C, 43D, 44B, 44C, 44D, 44E:												
Tumbling-------	0-6	Loam	ML, CL-ML, CL	A-4	0-8	0-8	95-100	90-100	75-95	55-75	13-25	2-9
	6-19	Clay loam, clay, cobbly clay loam, silty clay loam	CL	A-6, A-7	0-7	0-36	90-100	90-100	80-100	60-95	31-42	13-18
	19-47	Clay, cobbly clay, cobbly clay loam, silty clay loam	CL	A-6, A-7	0-7	0-36	90-100	90-100	80-100	60-95	31-42	13-18
	47-65	Cobbly clay, clay, cobbly clay loam, silty clay loam	CL	A-6, A-7	0-7	0-36	90-100	90-100	80-100	60-95	31-42	13-18
45, 46. Udorthents												
47. Udorthents-Urban land												
48. Urban land												
49C, 49D, 49E:												
Watahala--------	0-5	Very gravelly loam	GC-GM	A-2-4	0	0-7	55-60	40-50	35-45	25-35	16-27	3-9
	5-25	Gravelly loam, very gravelly loam, silt loam	SC-SM, SC, SM, CL-ML, CL, ML	A-4, A-2-4	0	0-7	65-85	45-80	35-80	25-70	16-27	3-9
	25-30	Gravelly silt loam, silt loam, very gravelly loam	CL, SC	A-2-4, A-6	0	0-7	65-85	45-80	35-80	25-70	25-39	8-16
	30-65	Clay, silty clay, gravelly silty clay	CH, MH, SM, SC	A-7	0	0-7	65-100	50-100	45-100	40-95	46-79	20-38

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
50D, 50E, 50F:												
Weikert---------	0-2	Silt loam	CL, CL-ML	A-4	0	0-2	80-95	75-90	70-90	55-80	16-30	2-10
	2-15	Very channery silt loam, very channery loam	GC, GC-GM, SC, SC-SM	A-2-4, A-4	0	0-10	45-60	25-45	20-45	15-40	16-31	2-10
	15-19	Extremely channery silt loam, extremely channery loam	GC-GM, GC	A-2-4	0	0-10	30-40	10-25	5-25	5-20	16-31	2-10
	19-29	Bedrock			---	---	---	---	---	---	---	---
51C, 51D, 51E, 51F:												
Westmoreland---	0-5	Silt loam	CL, CL-ML	A-4, A-6	0	0-2	80-95	75-95	65-95	55-85	21-31	6-13
	5-29	Silty clay loam, loam, channery silt loam	CL, SC	A-6, A-4	0	0-5	65-95	55-95	45-95	35-90	25-39	8-16
	29-51	Extremely channery silty clay loam, very channery loam, extremely channery silt loam	GC, GC-GM	A-2-6, A-2-4	0	0-5	25-50	5-40	5-40	5-35	23-39	7-16
	51-61	Bedrock			---	---	---	---	---	---	---	---
52D, 52E, 52F:												
Westmoreland----	0-5	Silt loam	CL, CL-ML	A-4, A-6	0	0-2	80-95	75-95	65-95	55-85	21-31	6-13
	5-29	Silty clay loam, loam, channery silt loam	CL, SC	A-6, A-4	0	0-5	65-95	55-95	45-95	35-90	25-39	8-16
	29-51	Extremely channery silty clay loam, very channery loam, extremely channery silt loam	GC, GC-GM	A-2-6, A-2-4	0	0-5	25-50	5-40	5-40	5-35	23-39	7-16
	51-61	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
53B:												
Wheeling--------	0-21	Loam	CL-ML, CL	A-4	0	0-8	85-100	80-100	70-95	50-75	18-25	4-8
	21-48	Loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-8	85-100	80-100	70-100	50-95	23-34	7-13
	48-65	Very fine sandy loam, sandy loam, extremely gravelly sandy loam	ML, CL-ML, SM, SC-SM, GP-GM, GM, GC-GM	A-4, A-1, A-2-4	0	0-22	35-100	15-100	10-95	5-65	12-21	1-6
54A:												
Wolfgap---------	0-14	Fine sandy loam	SC-SM, SC	A-4	0	0-7	85-100	80-100	55-85	30-55	18-25	4-8
	14-40	Loam, clay loam, gravelly silt loam, gravelly sandy clay loam	CL, SC	A-2-4, A-6	0	0-7	65-100	55-100	45-100	20-90	23-39	7-16
	40-72	Fine sandy loam, clay loam, gravelly loamy sand	SC-SM, SC, SM, CL, ML, CL-ML, SP-SM, SP-SC	A-4, A-6, A-2-4, A-1	0	0-13	70-100	60-100	30-100	10-90	12-39	1-16
55B, 55C, 55D:												
Wyrick----------	0-12	Silt loam	CL, CL-ML	A-4	0	0-3	85-100	75-100	70-100	55-90	21-31	6-11
	12-25	Silty clay loam, silt loam, loam	CL	A-6, A-4	0	0-3	85-100	75-100	65-100	45-95	25-39	8-16
	25-65	Silty clay, clay, silty clay loam	CL, CH, ML, MH	A-6, A-7	0	0-3	85-100	75-100	70-100	55-95	34-61	13-28
Marbie----------	0-7	Silt loam	CL, CL-ML	A-4	0	0	80-100	75-100	70-100	55-90	21-31	6-11
	7-18	Silt loam, silty clay loam, loam	CL	A-4, A-6	0	0	80-100	80-100	65-100	45-95	25-39	8-16
	18-41	Silt loam, silty clay loam, gravelly loam	CL	A-4, A-6	0	0	65-100	55-100	50-100	35-95	25-39	8-16
	41-65	Silty clay loam, clay, gravelly clay loam	CL, CH, MH, ML	A-6, A-7	0	0	70-100	65-100	60-100	45-95	30-57	11-26

Table 16.—Engineering Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
W. Water												

Table 17.—Physical Soil Properties

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

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
1B, 1C:														
Allegheny------	0-10	25-50	30-50	15-27	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	0.5-3.0	.28	.28	5	6	48
	10-65	15-75	10-65	18-35	1.20-1.50	4.00-14.00	0.08-0.22	0.0-2.9	0.0-0.5	.10	.15			
2A:														
Atkins---------	0-4	25-50	30-50	15-25	1.20-1.40	4.00-14.00	0.14-0.19	0.0-2.9	1.0-5.0	.28	.28	4	6	48
	4-28	15-80	10-65	18-35	1.20-1.50	0.42-14.00	0.10-0.19	0.0-2.9	0.5-2.0	.32	.37			
	28-65	15-80	10-80	10-35	1.20-1.50	1.40-42.00	0.03-0.19	0.0-2.9	0.5-1.0	.17	.43			
3D, 3E, 3F:														
Berks----------	0-2	5-35	50-80	10-25	1.20-1.50	4.00-42.00	0.17-0.18	0.0-2.9	0.5-2.0	.28	.37	2	6	48
	2-36	5-50	30-80	10-32	1.20-1.60	4.00-42.00	0.04-0.11	0.0-2.9	0.0-0.5	.10	.43			
	36-46	---	---	---	---	1.40-42.00	---	---	---	---	---			
4D, 4E:														
Bland----------	0-5	5-20	40-70	27-40	1.20-1.50	4.00-14.00	0.11-0.15	3.0-5.9	0.5-2.5	.37	.37	2	6	48
	5-24	5-30	10-50	45-60	1.30-1.60	1.40-4.00	0.09-0.14	3.0-5.9	0.0-0.5	.32	.32			
	24-34	---	---	---	---	0.00-4.00	---	---	---	---	---			
5B:														
Botetourt------	0-8	25-50	30-50	7-27	1.35-1.60	4.00-14.00	0.15-0.19	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	8-49	20-80	10-50	18-35	1.45-1.70	4.00-14.00	0.08-0.19	0.0-2.9	0.5-1.0	.28	.28			
	49-65	20-80	10-50	12-35	1.45-1.70	4.00-14.00	0.07-0.18	0.0-2.9	0.0-0.5	.28	.28			
6D, 6E, 6F:														
Calvin---------	0-6	5-40	50-80	10-25	1.20-1.40	14.00-42.00	0.17-0.20	0.0-2.9	0.5-2.0	.37	.43	2	5	56
	6-21	5-50	30-80	10-25	1.40-1.60	14.00-42.00	0.07-0.14	0.0-2.9	0.0-0.5	.32	.55			
	21-29	5-50	30-80	10-25	1.40-1.60	14.00-42.00	0.02-0.10	0.0-2.9	0.0-0.5	.05	.55			
	29-39	---	---	---	---	1.40-42.00	---	---	---	---	---			
7A:														
Clubcaf--------	0-10	0-30	51-80	12-20	1.35-1.60	4.00-14.00	0.20-0.22	0.0-2.9	2.0-10	.37	.37	5	5	56
	10-25	0-45	29-80	12-20	1.35-1.60	4.00-14.00	0.17-0.22	0.0-2.9	1.0-6.0	.49	.49			
	25-41	0-40	18-80	18-35	1.40-1.65	4.00-14.00	0.12-0.22	0.0-2.9	1.0-6.0	.37	.43			
	41-65	0-85	10-80	10-35	1.40-1.65	4.00-14.00	0.03-0.22	0.0-2.9	1.0-6.0	.24	.64			
8D, 8E:														
Dekalb---------	0-2	25-50	30-50	7-25	1.20-1.50	42.00-141.00	0.11-0.13	0.0-2.9	0.5-2.0	.28	.43	2	5	48
	2-21	40-80	5-45	5-18	1.20-1.50	42.00-141.00	0.05-0.12	0.0-2.9	0.0-0.5	.32	.49			
	21-29	55-85	5-30	5-15	1.20-1.50	42.00-141.00	0.01-0.04	0.0-2.9	0.0-0.5	.05	.37			
	29-39	---	---	---	---	0.00-4.00	---	---	---	---	---			

Table 17.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
9F:														
Drypond--------	0-3	25-50	30-80	7-20	1.25-1.40	42.00-141.00	0.10-0.14	0.0-2.9	0.5-2.0	.28	.43	1	5	48
	3-12	30-80	5-50	7-22	1.20-1.40	42.00-141.00	0.01-0.11	0.0-2.9	0.0-0.5	.24	.49			
	12-19	35-80	5-50	5-18	1.20-1.40	42.00-141.00	0.01-0.07	0.0-2.9	0.0-0.5	.05	.55			
	19-29	---	---	---	---	0.00-4.00	---	---	---	---	---			
Rock outcrop.														
10F:														
Drypond--------	0-3	25-50	30-80	7-20	1.25-1.40	42.00-141.00	0.10-0.14	0.0-2.9	0.5-2.0	.28	.43	1	5	48
	3-12	30-80	5-50	7-22	1.20-1.40	42.00-141.00	0.01-0.11	0.0-2.9	0.0-0.5	.24	.49			
	12-19	35-80	5-50	5-18	1.20-1.40	42.00-141.00	0.01-0.07	0.0-2.9	0.0-0.5	.05	.55			
	19-29	---	---	---	---	0.00-4.00	---	---	---	---	---			
11B:														
Ebbing---------	0-14	25-50	30-50	7-27	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	14-45	20-50	20-50	18-35	1.20-1.50	4.00-14.00	0.07-0.19	0.0-2.9	0.5-1.0	.32	.32			
	45-65	20-80	5-50	18-35	1.20-1.50	4.00-14.00	0.08-0.17	0.0-2.9	0.0-0.8	.32	.37			
12C, 12D, 12E:														
Edneytown------	0-4	35-50	35-50	5-15	1.40-1.60	14.00-42.00	0.14-0.19	0.0-2.9	0.5-3.0	.37	.37	5	5	56
	4-7	35-80	5-50	5-15	1.30-1.40	4.00-14.00	0.10-0.19	0.0-2.9	0.0-0.5	.49	.49			
	7-20	20-80	5-50	20-35	1.30-1.50	4.00-14.00	0.10-0.13	0.0-2.9	0.0-0.5	.24	.24			
	20-27	45-80	5-40	10-25	1.30-1.50	4.00-14.00	0.10-0.13	0.0-2.9	0.0-0.5	.20	.20			
	27-62	50-85	2-40	5-15	1.30-1.50	14.00-42.00	0.08-0.19	0.0-2.9	0.0-0.5	.15	.15			
13C, 13D, 13E:														
Elliber--------	0-6	5-40	50-80	5-15	1.20-1.40	14.00-42.00	0.06-0.10	0.0-2.9	0.5-2.5	.15	.43	5	5	38
	6-20	5-50	35-80	5-15	1.20-1.40	14.00-42.00	0.02-0.09	0.0-2.9	0.0-0.5	.17	.55			
	20-65	5-50	30-80	12-30	1.40-1.60	4.00-42.00	0.02-0.10	0.0-2.9	0.0-0.5	.15	.49			
14B, 14C:														
Ernest---------	0-9	15-35	50-70	15-20	1.20-1.40	4.00-14.00	0.17-0.22	0.0-2.9	0.5-3.0	.37	.37	4	5	56
	9-30	15-30	40-80	20-35	1.30-1.50	4.00-14.00	0.08-0.22	3.0-5.9	0.0-0.5	.49	.49			
	30-65	15-50	20-70	18-30	1.40-1.70	0.42-4.00	0.07-0.20	0.0-2.9	0.0-0.5	.32	.37			
15C, 15D, 15E:														
Faywood--------	0-4	5-35	50-80	15-27	1.30-1.40	4.00-14.00	0.18-0.22	0.0-2.9	0.5-2.5	.43	.43	2	6	48
	4-28	5-35	15-60	35-60	1.35-1.45	0.42-4.00	0.10-0.15	3.0-5.9	0.0-0.5	.32	.32			
	28-38	---	---	---	---	0.00-4.00	---	---	---	---	---			
16B, 16C, 16D, 16E:														
Frederick-----	0-9	5-35	50-80	13-27	1.25-1.50	14.00-42.00	0.17-0.22	0.0-2.9	0.5-2.5	.32	.32	5	6	48
	9-25	2-30	15-55	35-60	1.20-1.50	4.00-14.00	0.06-0.15	3.0-5.9	0.0-0.5	.17	.17			
	25-70	0-30	15-55	40-70	1.20-1.40	4.00-14.00	0.06-0.14	3.0-5.9	0.0-0.5	.17	.17			

Table 17.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
17C, 17D, 17E:														
Frederick------	0-9	5-35	50-80	13-27	1.25-1.50	14.00-42.00	0.07-0.11	0.0-2.9	0.5-2.5	.15	.32	5	6	0
	9-25	2-30	15-55	35-60	1.20-1.50	4.00-14.00	0.06-0.15	3.0-5.9	0.0-0.5	.17	.17			
	25-70	0-30	15-55	40-70	1.20-1.40	4.00-14.00	0.06-0.14	3.0-5.9	0.0-0.5	.17	.17			
18D:														
Greenlee-------	0-7	25-50	30-50	8-25	1.30-1.50	14.00-42.00	0.11-0.14	0.0-2.9	0.5-4.0	.10	.28	5	5	38
	7-53	25-80	5-50	3-25	1.40-1.60	14.00-42.00	0.07-0.15	0.0-2.9	1.0-2.0	.05	.24			
	53-62	35-90	5-50	1-18	1.40-1.60	14.00-42.00	0.03-0.15	0.0-2.9	0.0-0.5	.05	.28			
19C, 19E:														
Hagerstown-----	0-9	5-30	50-80	15-27	1.20-1.40	4.00-14.00	0.17-0.22	0.0-2.9	0.5-2.5	.37	.37	3	6	48
	9-50	2-25	15-60	35-60	1.20-1.60	4.00-14.00	0.09-0.12	3.0-5.9	0.0-0.5	.20	.20			
	50-60	---	---	---	---	0.00-4.00	---	---	---	---	---			
Rock outcrop.														
20C, 20D, 20E:														
Hagerstown-----	0-9	5-30	50-80	15-27	1.20-1.40	4.00-14.00	0.17-0.22	0.0-2.9	0.5-2.5	.37	.37	3	6	48
	9-50	2-25	15-60	35-60	1.20-1.60	4.00-14.00	0.09-0.12	3.0-5.9	0.0-0.5	.20	.20			
	50-60	---	---	---	---	0.00-4.00	---	---	---	---	---			
21D:														
Hagerstown-----	0-9	5-30	50-80	15-27	1.20-1.40	4.00-14.00	0.17-0.22	0.0-2.9	0.5-2.5	.37	.37	3	6	48
	9-50	2-25	15-60	35-60	1.20-1.60	4.00-14.00	0.09-0.12	3.0-5.9	0.0-0.5	.20	.20			
	50-60	---	---	---	---	0.00-4.00	---	---	---	---	---			
Rock outcrop.														
22C, 22D:														
Hagerstown-----	0-9	5-30	50-80	15-27	1.20-1.40	4.00-14.00	0.17-0.22	0.0-2.9	0.5-2.5	.37	.37	3	6	48
	9-50	2-25	15-60	35-60	1.20-1.60	4.00-14.00	0.09-0.12	3.0-5.9	0.0-0.5	.20	.20			
	50-60	---	---	---	---	0.00-4.00	---	---	---	---	---			
23C, 23D:														
Hayter---------	0-11	25-50	30-50	10-25	1.25-1.55	14.00-42.00	0.14-0.19	0.0-2.9	0.5-3.0	.24	.24	5	6	48
	11-65	20-80	5-50	18-35	1.30-1.60	14.00-42.00	0.07-0.19	0.0-2.9	0.0-0.5	.24	.32			
24B:														
Ingledove------	0-13	25-50	30-50	15-27	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	1.0-3.0	.24	.28	5	6	48
	13-52	20-80	5-50	18-35	1.20-1.50	4.00-14.00	0.10-0.19	0.0-2.9	0.5-1.0	.32	.32			
	52-65	20-80	5-50	18-35	1.20-1.50	4.00-14.00	0.05-0.19	0.0-2.9	0.0-0.5	.32	.32			

Table 17.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
25C, 25D, 25E:														
Konnarock------	0-2	5-40	50-80	10-25	1.20-1.40	14.00-42.00	0.11-0.15	0.0-2.9	0.5-2.5	.24	.37	2	6	38
	2-13	5-50	30-80	15-25	1.20-1.60	14.00-42.00	0.03-0.20	0.0-2.9	0.0-1.0	.15	.37			
	13-23	5-50	30-80	15-25	1.20-1.60	14.00-42.00	0.01-0.09	0.0-2.9	0.0-0.5	.15	.49			
	23-33	---	---	---	---	0.00-14.00	---	---	---	---	---			
26B, 26C, 26D, 26E:														
Lily----------	0-5	25-50	30-50	5-25	1.20-1.40	4.00-42.00	0.16-0.19	0.0-2.9	0.5-2.0	.37	.37	2	6	48
	5-24	25-80	5-50	18-35	1.25-1.55	14.00-42.00	0.11-0.19	0.0-2.9	0.0-0.5	.32	.43			
	24-34	---	---	---	---	0.00-4.00	---	---	---	---	---			
27D, 27E, 27F:														
Litz-----------	0-2	5-40	50-80	10-27	1.20-1.50	4.00-14.00	0.17-0.20	0.0-2.9	0.5-2.0	.32	.43	2	5	56
	2-13	5-50	20-80	10-35	1.20-1.50	4.00-14.00	0.01-0.10	0.0-2.9	0.0-0.5	.20	.49			
	13-35	5-50	20-80	10-35	1.20-1.50	4.00-14.00	0.01-0.10	0.0-2.9	0.0-0.5	.15	.49			
	35-45	---	---	---	---	1.40-42.00	---	---	---	---	---			
28C, 28D, 28E:														
Litz-----------	0-2	5-40	50-80	10-27	1.20-1.50	4.00-14.00	0.17-0.20	0.0-2.9	0.5-2.0	.32	.43	2	5	56
	2-13	5-50	20-80	10-35	1.20-1.50	4.00-14.00	0.01-0.10	0.0-2.9	0.0-0.5	.20	.49			
	13-35	5-50	20-80	10-35	1.20-1.50	4.00-14.00	0.01-0.10	0.0-2.9	0.0-0.5	.15	.49			
	35-45	---	---	---	---	1.40-42.00	---	---	---	---	---			
Groseclose-----	0-6	5-45	50-80	7-27	1.25-1.55	14.00-42.00	0.17-0.22	3.0-5.9	0.5-2.0	.37	.37	5	6	48
	6-43	5-45	15-60	35-60	1.35-1.60	0.42-1.40	0.09-0.15	6.0-8.9	0.0-0.5	.20	.20			
	43-65	5-45	10-75	25-50	1.35-1.60	0.42-1.40	0.09-0.22	3.0-5.9	0.0-5.0	.37	.37			
29A:														
Lobdell--------	0-9	25-50	30-50	15-27	1.20-1.40	4.00-14.00	0.17-0.19	0.0-2.9	1.0-4.0	.24	.24	5	6	48
	9-39	15-80	5-65	18-30	1.20-1.40	4.00-14.00	0.11-0.22	0.0-2.9	0.2-1.0	.37	.37			
	39-65	15-80	5-80	18-30	1.20-1.40	4.00-42.00	0.14-0.22	0.0-2.9	0.2-1.0	.28	.37			
30C, 30D, 30E:														
Macove---------	0-6	5-45	50-80	10-25	1.20-1.40	14.00-42.00	0.18-0.20	0.0-2.9	0.5-3.0	.24	.37	5	5	48
	6-13	5-50	30-80	10-30	1.20-1.50	14.00-42.00	0.15-0.20	0.0-2.9	0.0-0.5	.28	.43			
	13-65	5-50	30-70	10-30	1.20-1.50	14.00-42.00	0.08-0.17	0.0-2.9	0.0-0.5	.10	.37			
31C, 31D, 31E:														
Macove---------	0-6	5-45	50-80	10-25	1.20-1.40	14.00-42.00	0.07-0.10	0.0-2.9	0.5-3.0	.15	.37	5	5	38
	6-13	5-50	30-80	10-30	1.20-1.50	14.00-42.00	0.11-0.18	0.0-2.9	0.0-0.5	.20	.43			
	13-65	5-50	30-70	10-30	1.20-1.50	14.00-42.00	0.06-0.13	0.0-2.9	0.0-0.5	.15	.37			
32A:														
Maurertown-----	0-7	5-45	50-75	18-27	1.25-1.35	4.00-14.00	0.22-0.22	0.0-2.9	1.0-4.0	.37	.37	4	6	48
	7-65	5-45	10-60	35-60	1.30-1.50	0.01-0.42	0.12-0.15	6.0-8.9	0.0-1.0	.37	.37			

Table 17.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
33A:														
Mongle---------	0-9	25-50	30-80	15-27	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	9-20	15-50	25-65	18-35	1.20-1.50	4.00-14.00	0.11-0.22	0.0-2.9	0.5-1.0	.37	.37			
	20-65	15-50	25-65	18-35	1.20-1.60	4.00-14.00	0.12-0.22	0.0-2.9	0.0-0.5	.28	.37			
34B, 34C:														
Monongahela----	0-10	15-40	50-75	10-27	1.20-1.40	4.00-14.00	0.18-0.22	0.0-2.9	0.5-3.0	.43	.43	4	5	56
	10-27	15-75	15-65	18-35	1.30-1.50	4.00-14.00	0.09-0.22	0.0-2.9	0.0-0.5	.37	.37			
	27-65	15-50	30-65	18-35	1.30-1.60	0.42-4.00	0.08-0.22	0.0-2.9	0.0-0.5	.49	.49			
35C, 35D, 35E:														
Pigeonroost----	0-10	30-50	30-50	8-20	1.35-1.60	14.00-42.00	0.14-0.19	0.0-2.9	0.5-3.0	.28	.32	3	5	56
	10-23	25-80	5-50	18-35	1.30-1.50	4.00-14.00	0.10-0.19	0.0-2.9	0.0-0.5	.32	.43			
	23-36	30-80	5-50	8-20	1.35-1.60	4.00-14.00	0.10-0.19	0.0-2.9	0.0-0.5	.32	.43			
	36-46	---	---	---	---	1.40-42.00	---	---	---	---	---			
36F:														
Rock outcrop.														
Opequon--------	0-8	2-20	40-70	27-40	1.20-1.50	1.40-14.00	0.11-0.15	6.0-8.9	0.5-2.5	.32	.37	1	6	48
	8-14	2-30	5-60	35-75	1.40-1.70	1.40-14.00	0.07-0.15	6.0-8.9	0.5-1.0	.28	.32			
	14-24	---	---	---	---	0.00-4.00	---	---	---	---	---			
37B, 37C, 37D:														
Shottower------	0-8	25-50	30-50	15-27	1.30-1.45	4.00-42.00	0.15-0.19	0.0-2.9	0.5-3.0	.28	.28	5	6	48
	8-29	5-45	10-60	35-60	1.45-1.60	4.00-14.00	0.07-0.15	3.0-5.9	0.0-0.5	.24	.24			
	29-65	5-45	10-60	35-60	1.45-1.60	4.00-14.00	0.07-0.15	3.0-5.9	0.0-0.5	.10	.24			
38A:														
Sindion--------	0-9	15-45	50-70	15-27	1.35-1.60	4.00-14.00	0.21-0.22	0.0-2.9	1.0-6.0	.24	.24	4	6	48
	9-18	15-50	30-70	15-27	1.35-1.60	4.00-14.00	0.18-0.22	0.0-2.9	1.0-5.0	.32	.32			
	18-46	15-50	20-65	18-35	1.45-1.70	4.00-14.00	0.11-0.22	0.0-2.9	0.2-4.0	.24	.24			
	46-65	15-80	5-70	15-35	1.50-1.70	4.00-42.00	0.11-0.22	0.0-2.9	0.2-3.0	.37	.37			
39A:														
Speedwell------	0-11	25-45	30-50	12-20	1.20-1.40	4.00-14.00	0.15-0.19	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	11-65	15-75	10-65	18-35	1.30-1.50	4.00-14.00	0.10-0.22	0.0-2.9	0.2-3.0	.37	.37			
40B, 40C, 40D:														
Tate-----------	0-6	25-50	30-50	5-25	1.35-1.60	14.00-42.00	0.14-0.19	0.0-2.9	0.5-4.0	.28	.28	5	6	48
	6-65	20-75	10-50	18-35	1.30-1.45	4.00-14.00	0.07-0.19	0.0-2.9	0.0-1.0	.24	.32			
41B, 42C:														
Timberville----	0-10	10-45	50-80	6-25	1.30-1.50	14.00-42.00	0.17-0.22	0.0-2.9	1.0-4.0	.37	.37	5	5	56
	10-31	10-45	40-80	6-30	1.30-1.50	14.00-42.00	0.08-0.22	0.0-2.9	0.5-1.0	.43	.43			
	31-51	10-60	15-70	20-40	1.30-1.50	4.00-14.00	0.07-0.22	0.0-2.9	0.5-1.0	.32	.43			
	51-65	10-45	15-60	35-60	1.40-1.55	4.00-14.00	0.09-0.15	3.0-5.9	0.0-0.5	.24	.28			

Table 17.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
41B, 42C:														
Marbie---------	0-7	15-35	50-70	15-27	1.25-1.45	4.00-14.00	0.17-0.22	0.0-2.9	0.5-3.0	.37	.43	4	6	48
	7-18	15-50	30-65	20-35	1.30-1.55	4.00-14.00	0.10-0.22	3.0-5.9	0.0-0.5	.49	.49			
	18-41	15-50	30-65	20-35	1.65-1.85	0.42-1.40	0.07-0.22	3.0-5.9	0.0-0.5	.55	.55			
	41-65	5-45	15-60	25-55	1.35-1.65	1.40-14.00	0.08-0.15	3.0-5.9	0.0-0.2	.49	.49			
43B, 43C, 43D, 44B, 44C, 44D, 44E:														
Tumbling------	0-6	25-50	30-50	10-27	1.20-1.40	4.00-14.00	0.17-0.19	0.0-2.9	0.5-3.0	.28	.28	5	5	56
	6-19	15-45	15-60	25-40	1.20-1.45	4.00-14.00	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
	19-47	15-45	15-50	35-50	1.20-1.40	4.00-14.00	0.11-0.15	0.0-2.9	0.0-0.5	.17	.20			
	47-65	15-45	15-50	35-50	1.20-1.40	4.00-14.00	0.11-0.15	0.0-2.9	0.0-0.5	.10	.20			
45, 46. Udorthents														
47. Udorthents-Urban land														
48. Urban land														
49C, 49D, 49E:														
Watahala-------	0-5	25-50	30-50	10-22	1.25-1.45	14.00-42.00	0.08-0.10	0.0-2.9	0.5-2.5	.15	.37	4	5	38
	5-25	15-50	30-75	10-22	1.20-1.50	14.00-42.00	0.09-0.18	0.0-2.9	0.0-0.5	.24	.43			
	25-30	15-50	30-65	20-35	1.20-1.50	4.00-14.00	0.07-0.18	0.0-2.9	0.0-0.5	.28	.49			
	30-65	2-45	2-55	43-80	1.20-1.40	1.40-14.00	0.07-0.14	3.0-5.9	0.0-0.5	.15	.20			
50D, 50E, 50F:														
Weikert--------	0-2	5-40	50-80	10-25	1.20-1.40	14.00-42.00	0.17-0.20	0.0-2.9	0.5-2.0	.32	.43	1	5	56
	2-15	5-45	30-80	10-27	1.20-1.40	14.00-42.00	0.06-0.10	0.0-2.9	0.0-0.5	.15	.49			
	15-19	5-45	30-80	10-27	1.20-1.40	14.00-42.00	0.02-0.06	0.0-2.9	0.0-0.5	.05	.49			
	19-29	---	---	---	---	1.40-42.00	---	---	---	---	---			
51C, 51D, 51E, 51F:														
Westmoreland--	0-5	15-35	50-70	15-30	1.20-1.40	4.00-14.00	0.17-0.21	0.0-2.9	0.5-2.5	.28	.32	3	6	48
	5-29	15-50	20-65	20-35	1.20-1.50	4.00-14.00	0.07-0.21	0.0-2.9	0.0-0.5	.32	.43			
	29-51	15-50	20-65	18-35	1.20-1.50	4.00-14.00	0.01-0.08	0.0-2.9	0.0-0.5	.05	.43			
	51-61	---	---	---	---	1.40-42.00	---	---	---	---	---			

Table 17.—Physical Soil Properties—Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
52D, 52E, 52F:														
Westmoreland---	0-5	15-35	50-70	15-30	1.20-1.40	4.00-14.00	0.17-0.21	0.0-2.9	0.5-2.5	.28	.32	3	6	48
	5-29	15-50	20-65	20-35	1.20-1.50	4.00-14.00	0.07-0.21	0.0-2.9	0.0-0.5	.32	.43			
	29-51	15-50	20-65	18-35	1.20-1.50	4.00-14.00	0.01-0.08	0.0-2.9	0.0-0.5	.05	.43			
	51-61	---	---	---	---	1.40-42.00	---	---	---	---	---			
Rock outcrop.														
53B:														
Wheeling-------	0-21	35-50	30-50	12-20	1.20-1.40	4.00-42.00	0.15-0.19	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	21-48	15-50	30-70	18-30	1.30-1.50	4.00-14.00	0.13-0.22	0.0-2.9	0.5-1.0	.37	.37			
	48-65	50-80	10-40	5-30	1.30-1.50	4.00-14.00	0.02-0.16	0.0-2.9	0.0-0.5	.55	.55			
54A:														
Wolfgap--------	0-14	50-80	10-40	12-20	1.45-1.65	4.00-14.00	0.14-0.16	0.0-2.9	1.0-5.0	.17	.17	5	3	86
	14-40	15-80	10-70	18-35	1.45-1.65	4.00-14.00	0.08-0.22	0.0-2.9	0.2-3.0	.32	.32			
	40-72	15-85	10-80	5-35	1.50-1.70	4.00-14.00	0.06-0.22	0.0-2.9	0.2-3.0	.28	.28			
55B, 55C, 55D:														
Wyrick---------	0-12	15-35	50-70	15-27	1.40-1.65	4.00-14.00	0.17-0.22	3.0-5.9	0.5-3.0	.32	.32	5	6	48
	12-25	15-50	30-65	20-35	1.50-1.65	4.00-14.00	0.13-0.22	3.0-5.9	0.0-0.5	.43	.43			
	25-65	5-45	10-55	30-60	1.50-1.65	4.00-14.00	0.09-0.15	3.0-5.9	0.0-0.5	.32	.32			
Marbie---------	0-7	15-35	50-70	15-27	1.25-1.45	4.00-14.00	0.17-0.22	0.0-2.9	0.5-3.0	.37	.43	4	6	48
	7-18	15-50	30-65	20-35	1.30-1.55	4.00-14.00	0.10-0.22	3.0-5.9	0.0-0.5	.49	.49			
	18-41	15-50	30-65	20-35	1.65-1.85	0.42-1.40	0.07-0.22	3.0-5.9	0.0-0.5	.55	.55			
	41-65	5-45	15-60	25-55	1.35-1.65	1.40-14.00	0.08-0.15	3.0-5.9	0.0-0.2	.49	.49			
W.														
Water														

Table 18.—Chemical Soil Properties

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

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
1B, 1C:				
Allegheny------	0-10	5.0-14	4.0-10	3.6-5.5
	10-65	5.0-10	3.0-7.0	3.6-5.5
2A:				
Atkins---------	0-4	6.0-18	4.0-13	4.5-5.5
	4-28	6.0-13	4.0-10	4.5-5.5
	28-65	4.0-11	3.0-8.0	4.5-6.0
3D, 3E, 3F:				
Berks----------	0-2	4.0-11	3.0-8.0	3.6-6.5
	2-36	3.0-9.0	2.0-7.0	3.6-6.5
	36-46	---	---	---
4D, 4E:				
Bland----------	0-5	11-20	8.0-15	5.1-7.3
	5-24	16-22	12-17	5.1-7.3
	24-34	---	---	---
5B:				
Botetourt------	0-8	4.0-14	3.0-10	5.1-6.5
	8-49	6.0-11	4.0-8.0	5.1-6.5
	49-65	3.0-10	2.0-7.0	5.1-6.5
6D, 6E, 6F:				
Calvin---------	0-6	4.0-11	3.0-8.0	4.5-6.0
	6-21	3.0-7.0	2.0-6.0	4.5-6.0
	21-29	3.0-7.0	2.0-6.0	4.5-6.0
	29-39	---	---	---
7A:				
Clubcaf--------	0-10	8.0-28	6.0-21	5.6-8.4
	10-25	5.0-19	4.0-14	5.6-8.4
	25-41	7.0-22	5.0-17	5.6-8.4
	41-65	5.0-22	4.0-17	5.6-8.4
8D, 8E:				
Dekalb---------	0-2	3.0-11	2.0-8.0	3.6-5.5
	2-21	1.0-6.0	1.0-5.0	3.6-5.5
	21-29	1.0-5.0	1.0-4.0	3.6-5.5
	29-39	---	---	---
9F:				
Drypond--------	0-3	3.0-10	2.0-7.0	3.6-5.0
	3-12	2.0-6.0	1.0-5.0	3.6-5.0
	12-19	1.0-5.0	1.0-4.0	3.6-5.0
	19-29	---	---	---
Rock outcrop.				
10F:				
Drypond--------	0-3	3.0-10	2.0-7.0	3.6-5.0
	3-12	2.0-6.0	1.0-5.0	3.6-5.0
	12-19	1.0-5.0	1.0-4.0	3.6-5.0
	19-29	---	---	---

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
11B:				
Ebbing---------	0-14	4.0-14	3.0-10	5.1-7.3
	14-45	6.0-11	4.0-8.0	5.1-7.3
	45-65	5.0-10	3.0-8.0	5.1-7.3
12C, 12D, 12E:				
Edneytown------	0-4	2.0-11	2.0-8.0	4.5-5.5
	4-7	1.0-5.0	1.0-4.0	4.5-5.5
	7-20	5.0-10	4.0-7.0	4.5-5.5
	20-27	3.0-7.0	2.0-6.0	4.5-5.5
	27-62	1.0-5.0	1.0-4.0	4.5-5.5
13C, 13D, 13E:				
Elliber--------	0-6	2.0-9.0	2.0-7.0	3.6-5.5
	6-20	1.0-5.0	1.0-4.0	3.6-5.5
	20-65	3.0-9.0	1.0-7.0	3.6-5.5
14B, 14C:				
Ernest---------	0-9	5.0-12	4.0-9.0	4.5-6.0
	9-30	5.0-10	4.0-7.0	4.5-5.5
	30-65	5.0-9.0	3.0-7.0	4.5-5.5
15C, 15D, 15E:				
Faywood--------	0-4	5.0-12	4.0-9.0	5.1-7.8
	4-28	9.0-16	7.0-12	5.1-7.8
	28-38	---	---	---
16B, 16C, 16D, 16E:				
Frederick-----	0-9	4.0-12	3.0-9.0	4.5-6.0
	9-25	7.0-16	5.0-12	4.5-6.0
	25-70	10-19	8.0-14	4.5-6.0
17C, 17D, 17E:				
Frederick------	0-9	4.0-12	3.0-9.0	4.5-6.0
	9-25	9.0-16	7.0-12	4.5-6.0
	25-70	10-19	8.0-14	4.5-6.0
18D:				
Greenlee-------	0-7	3.0-15	2.0-11	3.6-6.0
	7-53	3.0-11	2.0-8.0	3.6-6.0
	53-62	1.0-6.0	1.0-4.0	3.6-6.0
19C, 19E:				
Hagerstown-----	0-9	5.0-12	4.0-9.0	5.1-6.5
	9-50	9.0-16	7.0-12	5.1-7.3
	50-60	---	---	---
Rock outcrop.				
20C, 20D, 20E:				
Hagerstown-----	0-9	5.0-12	4.0-9.0	5.1-6.5
	9-50	9.0-16	7.0-12	5.1-7.3
	50-60	---	---	---
21D:				
Hagerstown-----	0-9	5.0-12	4.0-9.0	5.1-6.5
	9-50	9.0-16	7.0-12	5.1-7.3
	50-60	---	---	---
Rock outcrop.				

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
22C, 22D:				
Hagerstown-----	0-9	5.0-12	4.0-9.0	5.1-6.5
	9-50	9.0-16	7.0-12	5.1-7.3
	50-60	---	---	---
23C, 23D:				
Hayter---------	0-11	5.0-17	4.0-14	5.1-6.5
	11-65	5.0-15	4.0-12	5.1-6.5
24B:				
Ingledove------	0-13	6.0-14	5.0-10	4.5-7.3
	13-52	6.0-11	4.0-8.0	4.5-7.3
	52-65	5.0-10	3.0-7.0	5.6-7.3
25C, 25D, 25E:				
Konnarock------	0-2	4.0-12	3.0-9.0	3.5-6.0
	2-13	4.0-9.0	3.0-6.0	3.5-6.0
	13-23	4.0-7.0	3.0-6.0	3.5-6.0
	23-33	---	---	---
26B, 26C, 26D, 26E:				
Lily----------	0-5	2.0-10	2.0-7.0	3.6-5.5
	5-24	5.0-10	3.0-7.0	3.6-5.5
	24-34	---	---	---
27D, 27E, 27F:				
Litz-----------	0-2	4.0-11	3.0-8.0	4.5-5.5
	2-13	3.0-10	2.0-7.0	4.5-5.5
	13-35	3.0-10	2.0-7.0	4.5-5.5
	35-45	---	---	---
28C, 28D, 28E:				
Litz-----------	0-2	4.0-11	3.0-8.0	4.5-5.5
	2-13	3.0-10	2.0-7.0	4.5-5.5
	13-35	3.0-10	2.0-7.0	4.5-5.5
	35-45	---	---	---
Groseclose-----	0-6	3.0-11	2.0-8.0	3.6-6.0
	6-43	9.0-16	7.0-12	3.6-5.5
	43-65	6.0-24	5.0-18	3.6-5.5
29A:				
Lobdell--------	0-9	6.0-16	5.0-12	5.1-7.3
	9-39	5.0-10	4.0-7.0	5.1-7.3
	39-65	5.0-10	4.0-7.0	5.6-7.3
30C, 30D, 30E, 31C, 31D, 31E:				
Macove--------	0-6	4.0-13	3.0-10	4.5-6.0
	6-13	3.0-9.0	2.0-7.0	4.5-6.0
	13-65	3.0-9.0	2.0-7.0	4.5-6.0
32A:				
Maurertown-----	0-7	9.0-18	6.0-14	5.6-7.3
	7-65	12-23	9.2-17	5.6-7.3

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
33A:				
Mongle---------	0-9	6.0-14	5.0-10	5.1-7.3
	9-20	6.0-11	4.0-8.0	5.1-7.3
	20-65	5.0-10	3.0-7.0	5.1-7.3
34B, 34C:				
Monongahela----	0-10	4.0-14	3.0-10	4.5-5.5
	10-27	5.0-10	3.0-7.0	4.5-5.5
	27-65	5.0-10	3.0-7.0	4.5-5.5
35C, 35D, 35E:				
Pigeonroost----	0-10	3.0-12	2.0-9.0	4.5-6.0
	10-23	5.0-10	3.0-7.0	4.5-6.0
	23-36	2.0-6.0	2.0-5.0	4.5-6.0
	36-46	---	---	---
36F:				
Rock outcrop.				
Opequon--------	0-8	11-20	8.0-15	5.1-8.4
	8-14	13-29	10-21	5.1-8.4
	14-24	---	---	---
37B, 37C, 37D:				
Shottower------	0-8	3.0-9.0	2.0-7.0	4.2-6.0
	8-29	4.0-7.0	3.0-5.0	4.2-6.0
	29-65	4.0-7.0	3.0-5.0	4.2-6.0
38A:				
Sindion--------	0-9	6.0-20	5.0-15	6.1-8.4
	9-18	6.0-18	5.0-14	6.1-8.4
	18-46	5.0-18	4.0-13	6.1-8.4
	46-65	4.0-16	3.0-12	6.1-8.4
39A:				
Speedwell------	0-11	5.0-12	4.0-9.0	6.1-8.4
	11-65	7.0-16	5.0-12	6.1-8.4
40B, 40C, 40D:				
Tate-----------	0-6	2.0-15	2.0-11	5.1-6.5
	6-65	5.0-11	3.0-8.0	5.1-6.5
41B, 42C:				
Timberville----	0-10	4.0-15	3.0-11	3.6-6.0
	10-31	3.0-10	2.0-7.0	3.6-6.0
	31-51	4.0-11	3.0-8.0	3.6-6.0
	51-65	9.0-16	7.0-12	3.6-6.0
Marbie---------	0-7	5.0-14	4.0-10	3.6-5.5
	7-18	5.0-10	4.0-7.0	3.6-5.5
	18-41	5.0-10	4.0-7.0	3.6-5.5
	41-65	6.0-14	5.0-11	3.6-5.5
43B, 43C, 43D, 44B, 44C, 44D, 44E:				
Tumbling------	0-6	2.0-9.0	2.0-7.0	4.5-6.0
	6-19	3.0-6.0	2.0-5.0	4.5-5.5
	19-47	4.0-6.0	3.0-5.0	4.5-5.5
	47-65	4.0-6.0	3.0-5.0	4.5-5.5

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
45, 46. Udorthents				
47. Udorthents-Urban land				
48. Urban land				
49C, 49D, 49E:				
Watahala-------	0-5	4.0-11	3.0-8.0	3.6-5.5
	5-25	3.0-7.0	2.0-5.0	3.6-5.5
	25-30	5.0-10	4.0-7.0	3.6-5.5
	30-65	11-21	8.0-16	4.5-5.5
50D, 50E, 50F:				
Weikert--------	0-2	5.0-11	4.0-8.0	4.5-6.0
	2-15	4.0-8.0	3.0-6.0	4.5-6.0
	15-19	4.0-8.0	3.0-6.0	4.5-6.0
	19-29	---	---	---
51C, 51D, 51E, 51F:				
Westmoreland--	0-5	5.0-13	4.0-10	4.5-6.0
	5-29	5.0-10	4.0-7.0	4.5-6.0
	29-51	5.0-10	3.0-7.0	5.1-6.0
	51-61	---	---	---
52D, 52E, 52F:				
Westmoreland---	0-5	5.0-13	4.0-10	4.5-6.0
	5-29	5.0-10	4.0-7.0	4.5-6.0
	29-51	5.0-10	3.0-7.0	5.1-6.0
	51-61	---	---	---
Rock outcrop.				
53B:				
Wheeling-------	0-21	5.0-12	4.0-9.0	5.1-6.0
	21-48	6.0-10	4.0-7.0	5.1-6.0
	48-65	1.0-9.0	1.0-7.0	5.1-6.0
54A:				
Wolfgap--------	0-14	5.0-16	4.0-12	6.1-8.4
	14-40	5.0-16	4.0-12	6.1-8.4
	40-72	2.0-16	1.0-12	6.1-8.4
55B, 55C, 55D:				
Wyrick---------	0-12	5.0-14	4.0-10	3.6-6.5
	12-25	5.0-10	4.0-7.0	3.6-5.5
	25-65	8.0-16	6.0-12	3.6-5.5
Marbie---------	0-7	5.0-14	4.0-10	3.6-5.5
	7-18	5.0-10	4.0-7.0	3.6-5.5
	18-41	5.0-10	4.0-7.0	3.6-5.5
	41-65	6.0-14	5.0-11	3.6-5.5
W. Water				

Table 19.—Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
1B, 1C:										
Allegheny	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
2A:										
Atkins	D	Negligible								
			January	0.0-1.0	>6.0	0.5-1.0	Brief	Frequent	Very brief	Frequent
			February	0.0-1.0	>6.0	0.5-1.0	Brief	Frequent	Very brief	Frequent
			March	0.0-1.0	>6.0	0.5-1.0	Brief	Frequent	Very brief	Frequent
			April	0.0-1.0	>6.0	0.5-1.0	Brief	Frequent	Very brief	Frequent
			May	0.0-1.0	>6.0	0.3-1.0	Brief	Frequent	Very brief	Frequent
			June	0.0-1.0	>6.0	0.2-0.7	Very brief	Occasional	Very brief	Occasional
			July	1.0-6.6	>6.0	0.1-0.5	Very brief	Occasional	Very brief	Occasional
			August	1.0-6.6	>6.0	0.1-0.5	Very brief	Occasional	Very brief	Occasional
			September	1.0-6.6	>6.0	0.1-0.5	Very brief	Occasional	Very brief	Occasional
			October	1.0-6.6	>6.0	0.2-0.7	Brief	Frequent	Very brief	Occasional
			November	0.0-1.0	>6.0	0.3-1.0	Brief	Frequent	Very brief	Frequent
			December	0.0-1.0	>6.0	0.5-1.0	Brief	Frequent	Very brief	Frequent
3D:										
Berks	C	Medium								
			Jan-Dec	---	---	---	---	None	---	---
3E, 3F:										
Berks	C	High								
			Jan-Dec	---	---	---	---	None	---	---
4D, 4E:										
Bland	C	Very high								
			Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
5B:										
Botetourt	C	Low								
			January	1.5-2.5	>6.0	---	---	None	Very brief	Rare
			February	1.5-2.5	>6.0	---	---	None	Very brief	Rare
			March	1.5-2.5	>6.0	---	---	None	Very brief	Rare
			April	1.5-2.5	>6.0	---	---	None	Very brief	Rare
			May	1.5-2.5	>6.0	---	---	None	Very brief	Rare
			June	2.5-6.6	>6.0	---	---	None	Very brief	Very rare
			July	---	---	---	---	None	Very brief	Very rare
			August	---	---	---	---	None	Very brief	Very rare
			September	---	---	---	---	None	Very brief	Very rare
			October	2.5-6.6	>6.0	---	---	None	Very brief	Very rare
			November	1.5-2.5	>6.0	---	---	None	Very brief	Rare
			December	1.5-2.5	>6.0	---	---	None	Very brief	Rare
6D:										
Calvin	C	Medium								
			Jan-Dec	---	---	---	---	None	---	---
6E, 6F:										
Calvin	C	High								
			Jan-Dec	---	---	---	---	None	---	---
7A:										
Clubcaf	D	Negligible								
			January	0.0-1.5	>6.0	0.2-0.5	Brief	Frequent	Very brief	Frequent
			February	0.0-1.5	>6.0	0.2-0.5	Brief	Frequent	Very brief	Frequent
			March	0.0-1.5	>6.0	0.2-0.5	Brief	Frequent	Very brief	Frequent
			April	0.0-1.5	>6.0	0.2-0.5	Brief	Frequent	Very brief	Frequent
			May	0.0-1.5	>6.0	0.2-0.5	Brief	Frequent	Very brief	Frequent
			June	0.0-1.5	>6.0	0.1-0.4	Very brief	Occasional	Very brief	Occasional
			July	1.5-6.6	>6.0	0.1-0.3	Very brief	Occasional	Very brief	Occasional
			August	1.5-6.6	>6.0	0.1-0.3	Very brief	Occasional	Very brief	Occasional
			September	1.5-6.6	>6.0	0.1-0.4	Very brief	Occasional	Very brief	Occasional
			October	1.5-6.6	>6.0	0.2-0.5	Brief	Frequent	Very brief	Occasional
			November	0.0-1.5	>6.0	0.2-0.5	Brief	Frequent	Very brief	Frequent
			December	0.0-1.5	>6.0	0.2-0.5	Brief	Frequent	Very brief	Frequent
8D, 8E:										
Dekalb	C	Very high								
			Jan-Dec	---	---	---	---	None	---	---
9F:										
Drypond	D	Very high								
			Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
9F:										
Rock outcrop	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---
10F:										
Drypond	D	Very high								
			Jan-Dec	---	---	---	---	None	---	---
11B:										
Ebbing	C	Low								
			January	1.5-3.0	>6.0	---	---	None	Very brief	Rare
			February	1.5-3.0	>6.0	---	---	None	Very brief	Rare
			March	1.5-3.0	>6.0	---	---	None	Very brief	Rare
			April	1.5-3.0	>6.0	---	---	None	Very brief	Rare
			May	1.5-3.0	>6.0	---	---	None	Very brief	Rare
			June	3.0-6.6	>6.0	---	---	None	Very brief	Very rare
			July	---	---	---	---	None	Very brief	Very rare
			August	---	---	---	---	None	Very brief	Very rare
			September	---	---	---	---	None	Very brief	Very rare
			October	3.0-6.6	>6.0	---	---	None	Very brief	Very rare
			November	1.5-3.0	>6.0	---	---	None	Very brief	Rare
			December	1.5-3.0	>6.0	---	---	None	Very brief	Rare
12C:										
Edneytown	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
12D, 12E:										
Edneytown	B	High								
			Jan-Dec	---	---	---	---	None	---	---
13C:										
Elliber	A	Low								
			Jan-Dec	---	---	---	---	None	---	---
13D, 13E:										
Elliber	A	Medium								
			Jan-Dec	---	---	---	---	None	---	---
14B, 14C:										
Ernest	C	Medium								
			January	1.5-3.0	3.0-5.0	---	---	None	---	None
			February	1.5-3.0	3.0-5.0	---	---	None	---	None
			March	1.5-3.0	3.0-5.0	---	---	None	---	None
			April	1.5-3.0	3.0-5.0	---	---	None	---	None
			November	1.5-3.0	3.0-5.0	---	---	None	---	None
			December	1.5-3.0	3.0-5.0	---	---	None	---	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
15C:										
Faywood	C	High	Jan-Dec	---	---	---	---	None	---	---
15D, 15E:										
Faywood	C	Very high	Jan-Dec	---	---	---	---	None	---	---
16B, 16C, 16D:										
Frederick	B	Medium	Jan-Dec	---	---	---	---	None	---	---
16E:										
Frederick	B	High	Jan-Dec	---	---	---	---	None	---	---
17C, 17D:										
Frederick	B	Medium	Jan-Dec	---	---	---	---	None	---	---
17E:										
Frederick	B	High	Jan-Dec	---	---	---	---	None	---	---
18D:										
Greenlee	B	Medium	Jan-Dec	---	---	---	---	None	---	---
19C:										
Hagerstown	B	Medium	Jan-Dec	---	---	---	---	None	---	---
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	---
19E:										
Hagerstown	B	High	Jan-Dec	---	---	---	---	None	---	---
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	---
20C:										
Hagerstown	B	Medium	Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
20D, 20E:										
Hagerstown	B	High								
			Jan-Dec	---	---	---	---	None	---	---
21D:										
Hagerstown	B	High								
			Jan-Dec	---	---	---	---	None	---	---
Rock outcrop	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---
22C:										
Hagerstown	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
22D:										
Hagerstown	B	High								
			Jan-Dec	---	---	---	---	None	---	---
23C:										
Hayter	B	Low								
			Jan-Dec	---	---	---	---	None	---	---
23D:										
Hayter	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
24B:										
Ingledove	B	Low								
			January	---	---	---	---	None	Very brief	Rare
			February	---	---	---	---	None	Very brief	Rare
			March	---	---	---	---	None	Very brief	Rare
			April	---	---	---	---	None	Very brief	Rare
			May	---	---	---	---	None	Very brief	Rare
			June	---	---	---	---	None	Very brief	Very rare
			July	---	---	---	---	None	Very brief	Very rare
			August	---	---	---	---	None	Very brief	Very rare
			September	---	---	---	---	None	Very brief	Very rare
			October	---	---	---	---	None	Very brief	Very rare
			November	---	---	---	---	None	Very brief	Rare
			December	---	---	---	---	None	Very brief	Rare
25C:										
Konnarock	C	High								
			Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
25D, 25E:										
Konnarock	C	Very high								
			Jan-Dec	---	---	---	---	None	---	---
26B, 26C:										
Lily	B	High								
			Jan-Dec	---	---	---	---	None	---	---
26D, 26E:										
Lily	B	Very high								
			Jan-Dec	---	---	---	---	None	---	---
27D, 27E, 27F:										
Litz	B	High								
			Jan-Dec	---	---	---	---	None	---	---
28C:										
Litz	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
Groseclose	C	High								
			Jan-Dec	---	---	---	---	None	---	---
28D, 28E:										
Litz	B	High								
			Jan-Dec	---	---	---	---	None	---	---
Groseclose	C	Very high								
			Jan-Dec	---	---	---	---	None	---	---
29A:										
Lobdell	B	Low								
			January	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			February	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			March	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			April	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			May	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			June	3.5-6.6	>6.0	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	3.5-6.6	>6.0	---	---	None	Very brief	Rare
			November	2.0-3.5	>6.0	---	---	None	Very brief	Occasional
			December	2.0-3.5	>6.0	---	---	None	Very brief	Occasional

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
30C:										
Macove	B	Low								
			Jan-Dec	---	---	---	---	None	---	---
30D, 30E:										
Macove	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
31C:										
Macove	B	Low								
			Jan-Dec	---	---	---	---	None	---	---
31D, 31E:										
Macove	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
32A:										
Maurertown	D	Negligible								
			January	0.0-0.5	>6.0	0.5-1.0	Brief	Occasional	Very brief	Rare
			February	0.0-0.5	>6.0	0.5-1.0	Brief	Occasional	Very brief	Rare
			March	0.0-0.5	>6.0	0.5-1.0	Brief	Occasional	Very brief	Rare
			April	0.0-0.5	>6.0	0.5-1.0	Brief	Occasional	Very brief	Rare
			May	0.0-0.5	>6.0	0.3-1.0	Brief	Occasional	Very brief	Rare
			June	0.0-0.5	>6.0	0.3-1.0	Very brief	Rare	Very brief	Very rare
			July	0.5-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Very rare
			August	0.5-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Very rare
			September	0.5-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Very rare
			October	0.5-6.6	>6.0	0.3-1.0	Very brief	Rare	Very brief	Very rare
			November	0.0-0.5	>6.0	0.3-1.0	Brief	Occasional	Very brief	Rare
			December	0.0-0.5	>6.0	0.5-1.0	Brief	Occasional	Very brief	Rare
33A:										
Mongle	C	Very high								
			January	0.5-1.5	>6.0	---	---	None	Very brief	Rare
			February	0.5-1.5	>6.0	---	---	None	Very brief	Rare
			March	0.5-1.5	>6.0	---	---	None	Very brief	Rare
			April	0.5-1.5	>6.0	---	---	None	Very brief	Rare
			May	0.5-1.5	>6.0	---	---	None	Very brief	Rare
			June	0.5-1.5	>6.0	---	---	None	Very brief	Very rare
			July	1.5-6.6	>6.0	---	---	None	Very brief	Very rare
			August	1.5-6.6	>6.0	---	---	None	Very brief	Very rare
			September	1.5-6.6	>6.0	---	---	None	Very brief	Very rare
			October	1.5-6.6	>6.0	---	---	None	Very brief	Very rare
			November	0.5-1.5	>6.0	---	---	None	Very brief	Rare
			December	0.5-1.5	>6.0	---	---	None	Very brief	Rare

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
34B, 34C:										
Monongahela	C	Medium								
			January	1.5-3.0	3.0-5.0	---	---	None	---	None
			February	1.5-3.0	3.0-5.0	---	---	None	---	None
			March	1.5-3.0	3.0-5.0	---	---	None	---	None
			April	1.5-3.0	3.0-5.0	---	---	None	---	None
			November	1.5-3.0	3.0-5.0	---	---	None	---	None
			December	1.5-3.0	3.0-5.0	---	---	None	---	None
35C:										
Pigeonroost	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
35D, 35E:										
Pigeonroost	B	High								
			Jan-Dec	---	---	---	---	None	---	---
36F:										
Rock outcrop	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---
Opequon	C	Very high								
			Jan-Dec	---	---	---	---	None	---	---
37B:										
Shottower	B	Low								
			Jan-Dec	---	---	---	---	None	---	---
37C:										
Shottower	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
37D:										
Shottower	B	High								
			Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
38A:										
Sindion-------------------	B	Low								
			January	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			February	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			March	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			April	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			May	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			June	3.0-6.6	>6.0	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	3.0-6.6	>6.0	---	---	None	Very brief	Rare
			November	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
			December	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
39A:										
Speedwell-----------------	B	Low								
			January	---	---	---	---	None	Very brief	Occasional
			February	---	---	---	---	None	Very brief	Occasional
			March	---	---	---	---	None	Very brief	Occasional
			April	---	---	---	---	None	Very brief	Occasional
			May	---	---	---	---	None	Very brief	Occasional
			June	---	---	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	---	---	---	---	None	Very brief	Rare
			November	---	---	---	---	None	Very brief	Occasional
			December	---	---	---	---	None	Very brief	Occasional
40B, 40C:										
Tate----------------------	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
40D:										
Tate----------------------	B	High								
			Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
41B:										
Timberville	B	Medium								
			January	---	---	---	---	None	Very brief	Frequent
			February	---	---	---	---	None	Very brief	Frequent
			March	---	---	---	---	None	Very brief	Frequent
			April	---	---	---	---	None	Very brief	Frequent
			May	---	---	---	---	None	Very brief	Frequent
			June	---	---	---	---	None	Very brief	Frequent
			July	---	---	---	---	None	Very brief	Frequent
			August	---	---	---	---	None	Very brief	Frequent
			September	---	---	---	---	None	Very brief	Frequent
			October	---	---	---	---	None	Very brief	Frequent
			November	---	---	---	---	None	Very brief	Frequent
			December	---	---	---	---	None	Very brief	Frequent
Marbie	C	Medium								
			January	2.0-4.0	4.0-5.0	---	---	None	Very brief	Frequent
			February	2.0-4.0	4.0-5.0	---	---	None	Very brief	Frequent
			March	2.0-4.0	4.0-5.0	---	---	None	Very brief	Frequent
			April	2.0-4.0	4.0-5.0	---	---	None	Very brief	Frequent
			May	---	---	---	---	None	Very brief	Frequent
			June	---	---	---	---	None	Very brief	Frequent
			July	---	---	---	---	None	Very brief	Frequent
			August	---	---	---	---	None	Very brief	Frequent
			September	---	---	---	---	None	Very brief	Frequent
			October	---	---	---	---	None	Very brief	Frequent
			November	2.0-4.0	4.0-5.0	---	---	None	Very brief	Frequent
			December	2.0-4.0	4.0-5.0	---	---	None	Very brief	Frequent
42C:										
Timberville	B	Medium								
			January	---	---	---	---	None	Very brief	Rare
			February	---	---	---	---	None	Very brief	Rare
			March	---	---	---	---	None	Very brief	Rare
			April	---	---	---	---	None	Very brief	Rare
			May	---	---	---	---	None	Very brief	Rare
			June	---	---	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	---	---	---	---	None	Very brief	Rare
			November	---	---	---	---	None	Very brief	Rare
			December	---	---	---	---	None	Very brief	Rare

Table 19.—Water Features—Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
42C:										
Marbie	C	High								
			January	2.0-4.0	4.0-5.0	---	---	None	Very brief	Rare
			February	2.0-4.0	4.0-5.0	---	---	None	Very brief	Rare
			March	2.0-4.0	4.0-5.0	---	---	None	Very brief	Rare
			April	2.0-4.0	4.0-5.0	---	---	None	Very brief	Rare
			May	---	---	---	---	None	Very brief	Rare
			June	---	---	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	---	---	---	---	None	Very brief	Rare
			November	2.0-4.0	4.0-5.0	---	---	None	Very brief	Rare
			December	2.0-4.0	4.0-5.0	---	---	None	Very brief	Rare
43B:										
Tumbling	B	Low								
			Jan-Dec	---	---	---	---	None	---	---
43C:										
Tumbling	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
43D:										
Tumbling	B	High								
			Jan-Dec	---	---	---	---	None	---	---
44B:										
Tumbling	B	Low								
			Jan-Dec	---	---	---	---	None	---	---
44C:										
Tumbling	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
44D, 44E:										
Tumbling	B	High								
			Jan-Dec	---	---	---	---	None	---	---
45, 46:										
Udorthents	D	Very high								
			Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
47:										
Udorthents	D	Very high								
			Jan-Dec	---	---	---	---	None	---	---
Urban land	D	Very high								
			Jan-Dec	---	---	---	---	None	---	---
48:										
Urban land	D	Very high								
			Jan-Dec	---	---	---	---	None	---	---
49C:										
Watahala	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
49D, 49E:										
Watahala	B	High								
			Jan-Dec	---	---	---	---	None	---	---
50D, 50E, 50F:										
Weikert	D	High								
			Jan-Dec	---	---	---	---	None	---	---
51C:										
Westmoreland	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
51D, 51E, 51F:										
Westmoreland	B	High								
			Jan-Dec	---	---	---	---	None	---	---
52D:										
Westmoreland	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
Rock outcrop	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---
52E, 52F:										
Westmoreland	B	High								
			Jan-Dec	---	---	---	---	None	---	---
Rock outcrop	---	Very high								
			Jan-Dec	---	---	---	---	None	---	---

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
53B:										
Wheeling	B	Low								
			January	---	---	---	---	None	Very brief	Rare
			February	---	---	---	---	None	Very brief	Rare
			March	---	---	---	---	None	Very brief	Rare
			April	---	---	---	---	None	Very brief	Rare
			May	---	---	---	---	None	Very brief	Rare
			June	---	---	---	---	None	Very brief	Very rare
			July	---	---	---	---	None	Very brief	Very rare
			August	---	---	---	---	None	Very brief	Very rare
			September	---	---	---	---	None	Very brief	Very rare
			October	---	---	---	---	None	Very brief	Very rare
			November	---	---	---	---	None	Very brief	Rare
			December	---	---	---	---	None	Very brief	Rare
54A:										
Wolfgap	B	Low								
			January	---	---	---	---	None	Very brief	Occasional
			February	---	---	---	---	None	Very brief	Occasional
			March	---	---	---	---	None	Very brief	Occasional
			April	---	---	---	---	None	Very brief	Occasional
			May	---	---	---	---	None	Very brief	Occasional
			June	---	---	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	---	---	---	---	None	Very brief	Rare
			November	---	---	---	---	None	Very brief	Occasional
			December	---	---	---	---	None	Very brief	Occasional
55B, 55C:										
Wyrick	B	Medium								
			Jan-Dec	---	---	---	---	None	---	---
Marbie	C	High								
			January	2.0-4.0	4.0-5.0	---	---	None	---	None
			February	2.0-4.0	4.0-5.0	---	---	None	---	None
			March	2.0-4.0	4.0-5.0	---	---	None	---	None
			April	2.0-4.0	4.0-5.0	---	---	None	---	None
			November	2.0-4.0	4.0-5.0	---	---	None	---	None
			December	2.0-4.0	4.0-5.0	---	---	None	---	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
55D:										
Wyrick--------------------	B	High								
			Jan-Dec	---	---	---	---	None	---	---
Marbie--------------------	C	Very high								
			January	2.0-4.0	4.0-5.0	---	---	None	---	None
			February	2.0-4.0	4.0-5.0	---	---	None	---	None
			March	2.0-4.0	4.0-5.0	---	---	None	---	None
			April	2.0-4.0	4.0-5.0	---	---	None	---	None
			November	2.0-4.0	4.0-5.0	---	---	None	---	None
			December	2.0-4.0	4.0-5.0	---	---	None	---	None
W.										
Water										

Table 20.—Soil Features

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

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
1B, 1C:							
Allegheny	---	---	---	---	Moderate	Low	High
2A:							
Atkins	---	---	---	---	High	High	Moderate
3D, 3E, 3F:							
Berks	Bedrock (lithic)	20-40	---	Very strongly cemented	Moderate	Low	High
4D, 4E:							
Bland	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	Moderate
5B:							
Botetourt	---	---	---	---	Moderate	Moderate	High
6D, 6E, 6F:							
Calvin	Bedrock (lithic)	20-40	---	Indurated	Moderate	Low	Moderate
7A:							
Clubcaf	---	---	---	---	High	High	Low
8D, 8E:							
Dekalb	Bedrock (lithic)	20-40	---	Indurated	Moderate	Low	High
9F:							
Drypond	Bedrock (lithic)	10-20	---	Indurated	Moderate	Low	High
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---
10F:							
Drypond	Bedrock (lithic)	10-20	---	Indurated	Moderate	Low	High
11B:							
Ebbing	---	---	---	---	High	Moderate	Moderate
12C, 12D, 12E:							
Edneytown	---	---	---	---	Moderate	Moderate	Moderate
13C, 13D, 13E:							
Elliber	---	---	---	---	Moderate	Low	High

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
14B, 14C:							
Ernest-----------	Fragipan	20-36	29-59	Strongly cemented	High	Moderate	Moderate
15C, 15D, 15E:							
Faywood----------	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	Moderate
16B, 16C, 16D, 16E, 17C, 17D, 17E:							
Frederick-------	---	---	---	---	Moderate	Moderate	High
18D:							
Greenlee---------	---	---	---	---	Moderate	Low	High
19C, 19E:							
Hagerstown-------	Bedrock (lithic)	40-60	---	Indurated	Moderate	Moderate	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
20C, 20D, 20E:							
Hagerstown-------	Bedrock (lithic)	40-60	---	Indurated	Moderate	Moderate	Low
21D:							
Hagerstown-------	Bedrock (lithic)	40-60	---	Indurated	Moderate	Moderate	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
22C, 22D:							
Hagerstown-------	Bedrock (lithic)	40-60	---	Indurated	Moderate	Moderate	Low
23C, 23D:							
Hayter-----------	---	---	---	---	Moderate	Moderate	Moderate
24B:							
Ingledove--------	---	---	---	---	Moderate	Low	High
25C, 25D, 25E:							
Konnarock--------	Bedrock (lithic)	20-40	---	Indurated	Moderate	Low	Moderate
26B, 26C, 26D, 26E:							
Lily-------------	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	High
27D, 27E, 27F:							
Litz-------------	Bedrock (lithic)	20-40	---	Very strongly cemented	Moderate	Low	High

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
28C, 28D, 28E:							
Litz	Bedrock (lithic)	20-40	---	Very strongly cemented	Moderate	Low	High
Groseclose	---	---	---	---	Moderate	High	High
29A:							
Lobdell	---	---	---	---	High	Low	Moderate
30C, 30D, 30E, 31C, 31D, 31E:							
Macove	---	---	---	---	Moderate	Moderate	Moderate
32A:							
Maurertown	---	---	---	---	High	High	High
33A:							
Mongle	---	---	---	---	High	Moderate	Moderate
34B, 34C:							
Monongahela	Fragipan	18-30	35-61	Strongly cemented	Moderate	High	High
35C, 35D, 35E:							
Pigeonroost	Bedrock (paralithic)	20-40	---	Moderately cemented	Moderate	Moderate	High
36F:							
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---
Opequon	Bedrock (lithic)	12-20	---	Indurated	Moderate	Moderate	Low
37B, 37C, 37D:							
Shottower	---	---	---	---	Moderate	High	Moderate
38A:							
Sindion	---	---	---	---	High	Low	Moderate
39A:							
Speedwell	---	---	---	---	Moderate	Low	Moderate
40B, 40C, 40D:							
Tate	---	---	---	---	Moderate	Moderate	Moderate
41B, 42C:							
Timberville	---	---	---	---	Moderate	Low	High
Marbie	Fragipan	18-36	15-39	Weakly cemented	Moderate	Moderate	Moderate

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In				
43B, 43C, 43D, 44B, 44C, 44D, 44E:							
Tumbling	---	---	---	---	Moderate	Moderate	Moderate
45, 46:							
Udorthents	---	---	---	---	Moderate	High	Moderate
47:							
Udorthents	---	---	---	---	Moderate	High	Moderate
Urban land	---	---	---	---	Moderate	---	---
48:							
Urban land	---	---	---	---	Moderate	---	---
49C, 49D, 49E:							
Watahala	Strongly contrasting textural stratification	20-50	---	---	Moderate	High	High
50D, 50E, 50F:							
Weikert	Bedrock (lithic)	10-20	---	Very strongly cemented	Moderate	Moderate	Moderate
51C, 51D, 51E, 51F:							
Westmoreland	Bedrock (lithic)	40-60	---	Very strongly cemented	Moderate	Low	High
52D, 52E, 52F:							
Westmoreland	Bedrock (lithic)	40-60	---	Very strongly cemented	Moderate	Low	High
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---
53B:							
Wheeling	---	---	---	---	Moderate	Low	Moderate
54A:							
Wolfgap	---	---	---	---	Moderate	Low	Moderate

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
55B, 55C, 55D:							
Wyrick-----------	---	---	---	---	Moderate	Moderate	Moderate
Marbie-----------	Fragipan	18-36	15-39	Weakly cemented	Moderate	Moderate	Moderate
W.							
Water							

Table 21.—Classification of the Soils

Soil name	Family or higher taxonomic class
Allegheny	Fine-loamy, mixed, semiactive, mesic Typic Hapludults
Atkins	Fine-loamy, mixed, active, acid, mesic Fluvaquentic Endoaquepts
Berks	Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
Bland	Fine, mixed, semiactive, mesic Typic Hapludalfs
Botetourt	Fine-loamy, siliceous, semiactive, mesic Ultic Hapludalfs
Calvin	Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
Clubcaf	Fine-silty, mixed, active, mesic Cumulic Endoaquolls
Dekalb	Loamy-skeletal, siliceous, active, mesic Typic Dystrudepts
Drypond	Loamy-skeletal, siliceous, active, mesic Lithic Dystrudepts
Ebbing	Fine-loamy, mixed, active, mesic Ultic Hapludalfs
Edneytown	Fine-loamy, mixed, active, mesic Typic Hapludults
Elliber	Loamy-skeletal, mixed, semiactive, mesic Typic Hapludults
Ernest	Fine-loamy, mixed, superactive, mesic Aquic Fragiudults
Faywood	Fine, mixed, active, mesic Typic Hapludalfs
Frederick	Fine, mixed, semiactive, mesic Typic Paleudults
Greenlee	Loamy-skeletal, mixed, semiactive, mesic Typic Dystrudepts
Groseclose	Fine, mixed, semiactive, mesic Typic Hapludults
Hagerstown	Fine, mixed, semiactive, mesic Typic Hapludalfs
Hayter	Fine-loamy, mixed, active, mesic Ultic Hapludalfs
Ingledove	Fine-loamy, siliceous, semiactive, mesic Ultic Hapludalfs
Konnarock	Loamy-skeletal, mixed, semiactive, mesic Typic Dystrudepts
Lily	Fine-loamy, siliceous, semiactive, mesic Typic Hapludults
Litz	Loamy-skeletal, mixed, active, mesic Ruptic-Ultic Dystrudepts
Lobdell	Fine-loamy, mixed, active, mesic Fluvaquentic Eutrudepts
Macove	Loamy-skeletal, mixed, active, mesic Typic Hapludults
Marbie	Fine-loamy, siliceous, semiactive, mesic Typic Fragiudults
Maurertown	Fine, mixed, semiactive, mesic Typic Endoaqualfs
Mongle	Fine-loamy, mixed, active, mesic Aeric Endoaqualfs
Monongahela	Fine-loamy, mixed, semiactive, mesic Typic Fragiudults
Opequon	Clayey, mixed, active, mesic Lithic Hapludalfs
Pigeonroost	Fine-loamy, mixed, active, mesic Typic Hapludults
Shottower	Fine, kaolinitic, mesic Typic Paleudults
Sindion	Fine-loamy, mixed, active, mesic Fluvaquentic Hapludolls
Speedwell	Fine-loamy, mixed, active, mesic Fluventic Hapludolls
Tate	Fine-loamy, mixed, semiactive, mesic Typic Hapludults
Timberville	Fine, mixed, active, mesic Typic Hapludults
Tumbling	Fine, kaolinitic, mesic Typic Paleudults
Udorthents	Udorthents
Watahala	Fine-loamy over clayey, siliceous over mixed, subactive, mesic Typic Paleudults
Weikert	Loamy-skeletal, mixed, active, mesic Lithic Dystrudepts
Westmoreland	Fine-loamy, mixed, active, mesic Ultic Hapludalfs
Wheeling	Fine-loamy, mixed, active, mesic Ultic Hapludalfs
Wolfgap	Fine-loamy, siliceous, active, mesic Fluventic Hapludolls
Wyrick	Fine-loamy, siliceous, semiactive, mesic Typic Paleudults

Table 22.—Relationship of Geology to Soils

Geologic period	Geologic epoch*	Deposit or formation**		Soil series
Quaternary	Holocene	Alluvium	ss, sh	Atkins
			ls, sh	Clubcaf Lobdell
			ls	Timberville
			ss, sh, ls	Wolfgap Speedwell Sindion
	Late Pleistocene	Alluvium	ss, sh, ls	Allegheny Botetourt Ebbing Mongle Monongahela Ingledove Maurertown Wheeling
		Colluvium	ss, sh	Macove Ernest
			sh, ls	Hayter
			ls	Marbie
			metased	Tate
	Early Pleistocene	Colluvium	ss, sh	Tumbling
Tertiary	Pliocene	Alluvium	ss, sh	Shottower
Mississippian		Pennington	sh, ls	Litz
		Cove Creek	ls	Westmoreland
		Greenbrier	ls	Westmoreland
		Price	ss, sh	Dekalb
Devonian		Chemung	ss, sh	Drypond
		Brallier	sh	Berks Weikert
		Millboro	sh	Berks Weikert
		Onondaga	ls, chert	Elliber
Silurian		Clinton	ss, sh	Lily
		Clinch	ss	Lily
Ordovician		Juniata	ss, sh	Calvin
		Martinsburg	sh, ls	Westmoreland Berks
		Athens	sh	Weikert
		Moccasin	ls, sh	Bland
		Lenoir	ls	Frederick Hagerstown
		Mosheim	ls	Hagerstown
		Beekmantown (Knox Group)	ls, ch	Frederick Watahala
		Chepultepec (Conococheage)	ls	Frederick Hagerstown

See footnotes at end of table.

Table 22.—Relationship of Geology to Soils—Continued

Geologic period	Geologic epoch*	Deposit or formation**		Soil series
Cambrian		Copper Ridge (Conococheague)	ls	Frederick
		Nolichucky	sh	Litz
		Honaker	ls	Frederick
		Rome	sh, ls	Groseclose Litz
		Shady	ls	Westmoreland
		Erwin	ss, sh	Lily Berks
		Hampton	sh, ss	Lily Berks
		Unicoi	ss, phyl, meta	Lily
Proterozoic (Pre-Cambrian)		Konnarock	till, rhyo	Konnarock
		Mount Rogers	gray, fel	Pigeonroost

* Geologic age of the unconsolidated deposit or the bedrock formation.

** Dominant bedrock lithology: ls=limestone; sh=shale; ss=sandstone; chert=chert; phyl=phyllite; till=tillite; gray=graywacke; fel=felsite; rhyo=rhyolite; metased=metasedimentary rocks.

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