United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Virginia Polytechnic Institute and State University

Soil Survey of Tazewell County, Virginia

How to Use This Soil Survey

General Soil Map

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

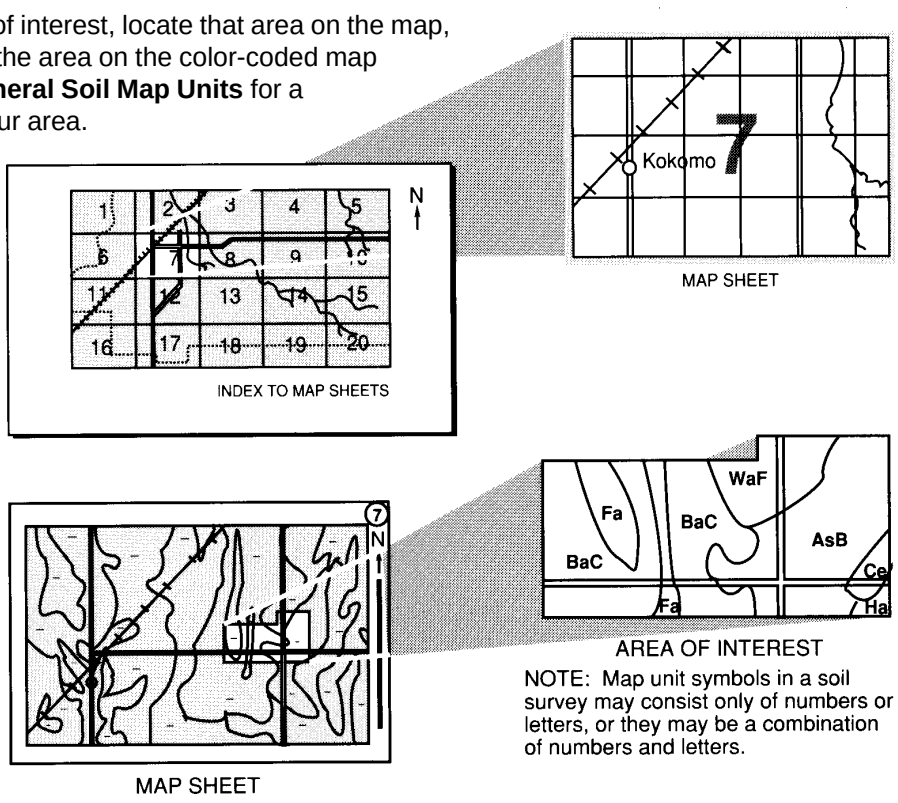
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

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

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

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



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

The **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.

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) leads the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1995. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1996. This survey was a cooperative project of the Natural Resources Conservation Service and the Virginia Polytechnic Institute and State University. Financial assistance was provided by the Virginia Department of Conservation and Recreation and the Tazewell County Board of Supervisors. The survey is part of the technical assistance furnished to the Tazewell Soil and Water Conservation District.

Cover: A cultivated field and a hayfield on Murrill silt loam, 7 to 15 percent slopes.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

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Foreword

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

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 that affect 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 shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

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

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Soil Survey of
Tazewell County, Virginia

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Fieldwork by David F. Wagner, Eddie L. Childers, Michael K. Schramm,
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United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
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TAZEWELL COUNTY is in the southwestern part of Virginia, about 85 miles southwest of Roanoke (fig. 1). It covers about 520 square miles, or 332,800 acres. This soil survey includes only private land. The survey does not include 7,800 acres in the Jefferson National Forest on mountains in the southern part of the county.

The soils in the county formed in material weathered from shale, limestone, dolomite, siltstone, sandstone, or coal beds. The soils, except those on the steeper ridges and mountain slopes, are suited to various farm and nonfarm uses. Woodland, which takes in about 60 percent of the county, is mainly on moderately steep to very steep slopes.

In 1799, Tazewell County was formed from the Wythe and Russell Territories. It was named for Senator Henry Tazewell, who opposed its formation.

According to the 1980 census, the population of Tazewell County was 50,511. The five incorporated towns in the county had populations of 5,946 for Bluefield, 5,796 for Richlands, 4,468 for Tazewell, 1,550 for Cedar Bluff, and 708 for Pocahontas.

The main sources of agricultural income are cattle, sheep, and dairies. Pigs and hogs are raised on a smaller scale, mostly for the production of feeder pigs. Pasture, the main crop, covers about 20 percent of the land area. Hay from grasses, legumes, and small grain is grown for winter feeding on some 13,000 acres. Corn is grown for local feed. Burley tobacco is a cash crop. Oaks, mostly for mining timbers and props, poplar, and maple are also harvested.

Coal mining and the production of mining equipment and supplies are important in Tazewell County. These industries employ more than 50 percent of the workforce in the county. Construction, electronics, communications, contract sewing, carbonated beverages, asphalt, and quarrying are also important.

The main highways in Tazewell County are U.S. 19 and U.S. 460, which run from Bluefield through Tazewell, north through Richlands and southwest toward Bristol. VA-16 runs north into West Virginia and south into North Carolina. VA-61 connects Tazewell County with Rocky Gap to the west. Interstate 77, Interstate 81, and the West Virginia Turnpike run close to the county.

Tazewell County is ranked eighth in tourism in Virginia. It offers natural beauty, recreation, and historic sites. The Historic Crab Orchard Museum and Pioneer Park, the Jefferson National Forest, and the Clinch Valley Wildlife Preserve are all worth a visit.

This soil survey updates the soil survey of Tazewell County published in 1948 (*3*). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section provides information on the physiography, relief, and drainage and the climate of the county.

Physiography, Relief, and Drainage

Tazewell County lies within the Appalachian Highlands. It is in the Valley and Ridge province and in

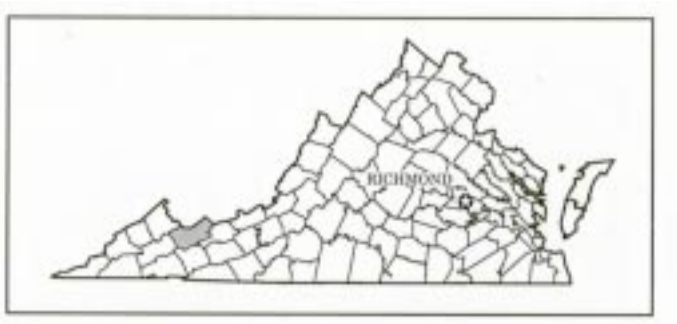

Figure 1.—Location of Tazewell County in Virginia.

the Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section.

The Valley and Ridge province takes in the central and southern parts of the county. It runs roughly southwest to northeast and covers about two-thirds of the land area. It has long valleys of varying widths that separate long, parallel, steep-sided ridges. In the valleys the soils are mainly moderately deep or deep. They are underlain by shale, siltstone, limestone, and dolomite. On mountains the soils are shallow to deep. They are underlain by shale, siltstone, and sandstone. Colluvium is common on side slopes and foot slopes of mountains. Alluvium on flood plains and terraces is common along Laurel Creek, Mud Fork Creek, Maiden Spring Creek, and the Clinch River and its tributaries.

The Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section, take in the northwestern part of the county. They cover about one-third of the land area. They consist of hollows separating random, steep-sided ridges. They formed on a weathered, eroded, ancient plateau. The soils are shallow to deep and are underlain by shale, sandstone, and coal beds. A large acreage consists of strip mines and deep mines.

The highest point in the county, 4,710 feet, is on Beartown Ridge in the southeastern part of the county. The lowest elevation, 1,913 feet, is on the flood plain of the Clinch River near Raven in the western part of the county.

The headwaters of several large streams are located in Tazewell County. Watersheds flow east into the New River, north into the Big Sandy River, west into the Clinch River, and south into the Holston River. The forks of the Clinch River, which run nearly the length of Tazewell County, begin near Tiptop and Gratton.

Surface drainage in the county generally is good. Some notable exceptions are some upland flats and some areas on flood plains and on foot slopes of uplands.

Climate

This section was prepared by the Natural Resources Conservation Service, Climatic Data Access Facility, Portland, Oregon.

Data about thunderstorms, relative humidity, percentage of sunshine, and wind are given in this section. They were based on estimates made at weather stations in Beckley, West Virginia, and Greensboro, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Burkes Garden in the period 1961 to 1990. 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 29.3 degrees F and the average daily minimum temperature is 18.9 degrees. The lowest temperature on record, which occurred on January 27, 1987, is -26 degrees. In summer, the average temperature is 65.3 degrees and the average daily maximum temperature is 76.3 degrees. The highest recorded temperature, which occurred on July 16, 1954, is 96 degrees.

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

The total annual precipitation is about 44.33 inches. Of this, about 20.42 inches, or 46 percent, usually falls in May through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 14.65 inches. The heaviest 1-day rainfall during the period of record was 3.94 inches on August 18, 1972. Thunderstorms occur on about 44 days each year, and most occur in summer.

The average seasonal snowfall is about 52.5 inches. The greatest snow depth at any one time during the period of record was 18 inches. On average, 33 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 64 percent of the time possible in summer and 54 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 9.1 miles per hour, in March.

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 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. 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 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. First, soil scientists classified and named the soils in the survey area. Next, they compared the individual soils with similar soils in the same taxonomic class in other areas. As a result, 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. They also interpret the field-observed characteristics and the soil properties in determining 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. 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.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another, but in a different pattern. Table 4 shows the acreage and proportionate extent of the soils of the general soil map.

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

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

Soil Descriptions

1. Guernsey-Craigsville-Melvin

Nearly level to strongly sloping, poorly drained to well drained, very deep soils formed in alluvium; on the lower hills, on terraces, and on flood plains

Setting

Topography: Foot slopes, toe slopes, terrace treads and risers, and flood plains
Physiography: Lower residual and colluvial slopes and toeslopes in the Valley and Ridge province and toe slopes in the Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Slope range: 0 to 15 percent
Drainage pattern: Dendritic
Feature: Particle sizes range from loamy-skeletal to fine-silty to clayey

Composition

Percent of survey area: 4.8 percent
Guernsey soils—19 percent
Craigsville soils—16 percent
Melvin soils—13 percent
Minor soils—52 percent

Soil Properties

Guernsey

Depth: Very deep
Drainage class: Moderately well drained
Parent material: Residuum and colluvium derived from sandstone, siltstone, shale, and limestone
Textural class: Fine (clayey)
Permeability: Moderately slow or slow

Craigsville

Depth: Very deep
Drainage class: Well drained
Parent material: Alluvium derived from shale, silt, and sandstone
Textural class: Loamy-skeletal
Permeability: Moderately rapid or rapid

Melvin

Depth: Very deep
Drainage class: Poorly drained
Parent material: Alluvium derived from limestone, shale, siltstone, and sandstone
Textural class: Fine-silty
Permeability: Moderate

Minor soils

- Areas of very deep, well drained Allegheny soils on terrace treads and risers
- Areas of very deep, moderately well drained Coursey soils on terrace treads and risers
- Areas of very deep, moderately well drained Lindside soils on flood plains
- Areas of very deep, somewhat poorly drained Newark soils on flood plains
- Areas of deep, moderately well drained Philo soils on flood plains

• Areas of very deep, well drained Pope soils on flood plains
• Areas of very deep, poorly drained Purdy soils on terrace treads

Use and Management

Major Uses: Pasture, hay, or some cultivated crops

Cropland and pasture

Suitability: Well suited to pasture and hay; well suited or moderately well suited to cropland
Major management factors: Slope on cropland in strongly sloping areas, frequent flooding, and the seasonal high water table

Woodland

Suitability: Well suited
Major management factors: The seasonal high water table and low strength

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Frequent flooding and the seasonal high water table

Building site development

Suitability: Poorly suited or not suited
Major management factors: Frequent flooding and the seasonal high water table

2. Berks-Gilpin-Weikert

Strongly sloping to very steep, well drained, moderately deep soils formed in materials weathered from acid shale interbedded with fine grained sandstone and siltstone; on ridges and spurs

Setting

Topography: Summits, shoulders, and back slopes
Physiography: Uplands in the Valley and Ridge province and in the Appalachian Plateaus, Cumberland Plateau and Cumberland Mountains
Slope range: 7 to 70 percent
Drainage pattern: Dendritic
Surface features: Slope exceeds 35 percent on 72 percent of the unit

Composition

Percent of survey area: 12.0 percent
Berks soils—60 percent
Gilpin soils—17 percent
Weikert soils—23 percent

Soil Properties

Berks

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from acid shale interbedded with fine grained sandstone and siltstone
Textural class: Loamy-skeletal
Permeability: Moderate and moderately rapid

Gilpin

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from noncalcareous shale
Textural class: Fine-loamy
Permeability: Moderate

Weikert

Depth: Shallow
Drainage class: Somewhat excessively drained
Parent material: Residuum derived from acid shale interbedded with fine grained sandstone and siltstone
Textural class: Loamy-skeletal
Permeability: Moderately rapid

Use and Management

Major Use: Woodland

Cropland and pasture

Suitability: Fairly suited to hay, well suited to pasture, and poorly suited to crops in strongly sloping areas; not suited to these crops on very steep slopes
Major management factors: Slope and droughtiness

Woodland

Suitability: Well suited to poorly suited
Major management factors: Slope, depth to bedrock, droughtiness, and, in steeper areas, an erosion hazard

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Depth to bedrock and slope

Building site development

Suitability: Moderately well suited to not suited
Major management factors: Depth to bedrock and slope

3. Calvin-Alticrest-Wallen

Strongly sloping to very steep, well drained, moderately deep soils formed in materials weathered from acid sandstone and shale; on ridges and spurs

Setting

Topography: Summits, shoulders, and back slopes (fig. 2)
Physiography: Uplands in the Valley and Ridge province and in the Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Slope range: 5 to 75 percent
Drainage pattern: Dendritic
Surface features: Very stony or extremely stony on about 57 percent of the unit and general or common areas of rock outcrop on 16 percent; slopes greater than 35 percent on about 55 percent

Composition

Percent of survey area: 12.0 percent
Calvin soils—28 percent
Alticrest soils—27 percent
Wallen soils—27 percent
Minor soils—18 percent

Soil Properties

Calvin

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from red shale and fine grained sandstone
Textural class: Loamy-skeletal
Permeability: Moderately rapid

Alticrest

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from acid sandstone
Textural class: Coarse-loamy
Permeability: Moderately rapid

Wallen

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from acid sandstone
Textural class: Loamy-skeletal
Permeability: Rapid or moderately rapid

Minor soils

• Areas of shallow, excessively drained Drypond soils on residual uplands on Brushy Mountain along the boundary of Tazewell and Smyth Counties in the Valley and Ridge province

• Areas of moderately deep, well drained Lily soils on residual uplands in the Valley and Ridge province

Use and Management

Major Use: Woodland

Cropland and pasture

Suitability: Fairly suited to hay, well suited to pasture, and poorly suited to crops in strongly sloping areas; not suited to these crops on very steep slopes and in areas of rock outcrops
Major management factors: Slope, rock outcrops in steeper areas, and stones and boulders on the surface

Woodland

Suitability: Moderately well suited to poorly suited
Major management factors: Slope, rock outcrops in steeper areas, stones and boulders on the surface, droughtiness, and, in steeper areas, an erosion hazard

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Depth to bedrock, slope, and, in steeper areas, rock outcrops

Building site development

Suitability: Moderately well suited to not suited
Major management factors: Depth to bedrock, slope, and, in steeper areas, rock outcrops

4. Chiswell-Litz-Groseclose

Gently sloping to very steep, well drained, shallow to very deep soils formed in materials weathered from shale interbedded with some limestone but mostly with fine grained sandstone and siltstone; on hills

Setting

Topography: Summits, shoulders, back slopes, and some foot slopes
Physiography: Hills in the Valley and Ridge province
Slope range: 2 to 60 percent
Drainage pattern: Dendritic
Surface features: Slopes steeper than 15 percent on about 95 percent of this unit, slopes steeper than 25 percent on 76 percent, and slopes steeper than 35 percent on 39 percent; fairly common areas of rock outcrops on steeper slopes

Figure 2.—An exposure of Clinch Sandstone, which underlies Wallen and Lily soils in the Valley and Ridge province in the Appalachian Highlands.

Composition

Percent of survey area: 0.9 percent
Chiswell soils—52 percent
Litz soils—31 percent
Groseclose soils—17 percent

Soil Properties

Chiswell

Depth: Shallow
Drainage class: Well drained
Parent material: Shale interbedded with fine grained sandstone and siltstone and scattered limestone
Textural class: Loamy-skeletal
Permeability: Moderate

Litz

Depth: Moderately deep
Drainage class: Well drained
Parent material: Shale interbedded with fine grained sandstone and siltstone and scattered limestone
Textural class: Loamy-skeletal
Permeability: Moderate

Groseclose

Depth: Very deep
Drainage class: Well drained
Parent material: Limestone interbedded with shale, siltstone, and sandstone
Textural class: Clayey
Permeability: Slow

Use and Management

Major Use: Woodland or pasture

Cropland and pasture

Suitability: Well suited to cropland and hay in gently sloping and strongly sloping areas; well suited to pasture in moderately steep areas; not suited to these crops in steep and very steep areas
Major management factors: Slope, high acidity, low natural fertility

Woodland

Suitability: Well suited to poorly suited
Major management factors: Slope, depth to bedrock, droughtiness in steeper areas, and an erosion hazard in steeper areas

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Slope and depth to bedrock on Chiswell and Litz soils and too clayey on Groseclose soils

Building site development

Suitability: Poorly suited or not suited
Major management factors: Slope and depth to bedrock on Chiswell and Litz soils and shrinking and swelling on Groseclose soils

5. Frederick-Carbo-Bland

Gently sloping to very steep, well drained, moderately deep to very deep soils formed in materials weathered from dolomitic limestone interbedded with sandstone, shale, calcitic limestone, and argillaceous limestone; on hills and spurs

Setting

Topography: Summits, shoulders, back slopes, and some foot slopes
Physiography: Hills and spurs in the Valley and Ridge province
Slope range: 2 to 65 percent
Drainage pattern: Dendritic
Surface features: Slopes of less than 15 percent on about 17 percent is this unit; karst on 21 percent; a complex with rock outcrops on 40 percent; slopes of more than 35 percent on 20 percent

Composition

Percent of survey area: 27.7 percent
Frederick soils—52 percent
Carbo soils—35 percent
Bland soils—7 percent
Minor soils—6 percent

Soil Properties

Frederick

Depth: Very deep
Drainage class: Well drained
Parent material: Dolomitic limestone interbedded with sandstone and shale
Textural class: Clayey
Permeability: Moderate

Carbo

Depth: Moderately deep
Drainage class: Well drained
Parent material: Limestone
Textural class: Very-fine (clayey)
Permeability: Slow

Bland

Depth: Moderately deep
Drainage class: Well drained
Parent material: Argillaceous limestone
Textural class: Fine
Permeability: Moderately slow

Minor soils

- Areas of moderately deep, well drained Brushy soils on hills and spurs
- Areas of shallow, somewhat excessively drained Newbern soils on escarpments, generally along streams
- Areas of very deep, well drained Pisgah soils in limestone valleys
- Areas of very deep, well drained Timberville soils on hills and drainageways

Use and Management

Major Use: Pasture, woodland, hayland, or cropland

Cropland and pasture

Suitability: Well suited to cropland in gently sloping and strongly sloping areas; well suited to hay in gently sloping to moderately steep areas; well suited to pasture on slopes ranging to steep; not suited to crops, hay, or pasture in very steep areas
Major management factors: Slope, rock outcrops on steeper slopes, and, on Bland and Carbo soils, droughtiness

Woodland

Suitability: Well suited to poorly suited
Major management factors: Rock outcrops, slope, and, in steeper areas, an erosion hazard

Sanitary facilities

Suitability: Fairly suited to not suited
Major management factors: Slow percolation rate, slope, and depth to bedrock

Building site development

Suitability: Poorly suited or not suited
Major management factors: Shrinking and swelling, slope, and depth to bedrock

6. Madsheep-Paddyknob

Strongly sloping to very steep, well drained, moderately deep soils formed in materials weathered from acid sandstone and shale; on mountains

Setting

Topography: Summits, shoulders, and back slopes
Physiography: Uplands in the Valley and Ridge province at elevations of at least 4,000 feet on the north aspect and 4,400 feet on the south aspect
Slope range: 7 to 80 percent slopes
Drainage pattern: Dendritic
Surface features: Very stony or extremely stony on 96 percent of this unit and a complex with rock outcrops on 22 percent

Composition

Percent of survey area: 0.6 percent
Madsheep soils—44 percent
Paddyknob soils—56 percent

Soil Properties

Madsheep

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from red shale and fine grained sandstone
Textural class: Loamy-skeletal
Permeability: Moderately rapid

Paddyknob

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from acid sandstone
Textural class: Loamy-skeletal
Permeability: Rapid

Use and Management

Major Use: Woodland

Cropland and pasture

Suitability: Poorly suited or not suited
Major management factors: Slope, rock outcrops in steeper areas, and stones and boulders on the surface

Woodland

Suitability: Moderately well suited to poorly suited
Major management factors: Slope, rock outcrops in steeper areas, stones and boulders on the surface, droughtiness, and an erosion hazard in steeper areas

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Depth to bedrock, slope, and rock outcrops in steeper areas

Building site development

Suitability: Moderately well suited to not suited
Major management factors: Depth to bedrock, slope, and rock outcrops in steeper areas

7. Westmoreland-Poplimento-Berks

Strongly sloping to very steep, well drained, moderately deep to very deep soils formed in materials weathered from shale interbedded with limestone and, in some places, with fine grained sandstone and siltstone; on ridges and spurs

Setting

Topography: Summits, shoulders, and back slopes; foot slopes in strongly sloping areas
Physiography: Uplands in the Valley and Ridge province
Slope range: 7 to 60 percent
Drainage pattern: Dendritic
Surface features: Slopes of more than 25 percent on 87 percent of this unit; slopes of more than 35 percent on 64 percent; and common areas of rock outcrops, especially on steeper slopes

Composition

Percent of survey area: 9.5
Westmoreland soils—47 percent
Poplimento soils—35 percent
Berks soils—18 percent

Soil Properties

Westmoreland

Depth: Deep and very deep
Drainage class: Well drained
Parent material: Shale interbedded with limestone
Textural class: Fine-loamy
Permeability: Moderate

Poplimento

Depth: Very deep
Drainage class: Well drained
Parent material: Shale interbedded with limestone
Textural class: Fine (clayey)
Permeability: Moderately slow

Berks

Depth: Moderately deep
Drainage class: Well drained
Parent material: Shale interbedded with fine grained sandstone and siltstone
Textural class: Loamy-skeletal
Permeability: Moderate and moderately rapid

Use and Management

Major Use: Pasture or woodland

Cropland and pasture

Suitability: Well suited to cropland in strongly sloping areas; well suited to hay in strongly sloping and moderately steep areas; well suited to pasture on slopes ranging to steep; not suited to these crops in very steep areas
Major management factors: Slope

Woodland

Suitability: Well suited to fairly suited
Major management factors: Slope; an erosion hazard in steeper areas

Sanitary facilities

Suitability: Fairly suited to not suited
Major management factors: Slope; percs slowly

Building site development

Suitability: Moderately well suited to not suited
Major management factors: Slope; shrinking and swelling on Poplimento soils

8. Oriskany-Murrill

Gently sloping to very steep, well drained, very deep soils formed in colluvial materials weathered from acid sandstone, siltstone, and shale; on colluvial landforms

Setting

Topography: Back slopes and foot slopes (fig. 3)
Physiography: Colluvial slopes in the Valley and Ridge province
Slope range: 2 to 55 percent
Drainage pattern: Dendritic
Surface features: Extremely stony on slopes of more than 35 percent; slopes of more than 35 percent on 34 percent of this unit

Composition

Percent of survey area: 18.6 percent
Oriskany soils—95 percent
Murrill soils—5 percent

Soil Properties

Oriskany

Depth: Very deep
Drainage class: Well drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Textural class: Fine-loamy
Permeability: Moderately rapid

Murrill

Depth: Very deep
Drainage class: Well drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Textural class: Loamy-skeletal
Permeability: Moderate above a depth of 40 inches and moderately slow below that depth

Use and Management

Major Use: Woodland or pasture

Cropland and pasture

Suitability: Well suited to cropland and hay on gently sloping and strongly sloping Murrill soils; poorly suited to cropland and fairly suited to hay on gently sloping and strongly sloping Oriskany soils if cleared of stones; well suited to pasture in gently sloping to steep areas; not suited to these crops in very steep areas
Major management factors: Slope, droughtiness on Oriskany soils, and stones and boulders on the surface in steeper areas

Woodland

Suitability: Well suited to poorly suited
Major management factors: Slope, droughtiness on Oriskany soils, and stones and boulders on the surface

Sanitary facilities

Suitability: Moderately well suited to not suited
Major management factors: Slope, seepage, and large stones

Building site development

Suitability: Moderately well suited to not suited
Major management factors: Slope, large stones on Oriskany soils, and shrinking and swelling on Murrill soils

Figure 3.—Typical mountain landscape with Murrill silt loam in the foreground; Bland and Carbo soils above the fence; Oriskany soils in drainageways; Westmoreland, Poplimento, and Berks soils on steep nose slopes; and Calvin and Wallen soils on the main ridge of Clinch Mountain.

9. Cedarcreek-Alticrest-Grimsley

Nearly level to very steep, well drained, moderately deep to very deep soils formed in materials weathered from mine spoil, acid sandstone, and colluvium derived from sandstone and shale; on summits, mountain slopes, benches, out slopes, and foot slopes

Setting

Physiography: Uplands and slopes in the Appalachian Plateaus, Cumberland Plateau and the Cumberland Mountain section
Slope range: 0 to 70 percent
Drainage pattern: Dendritic
Surface features: Slopes steeper than 35 percent on 63 percent of this unit; common rock outcrops that occur as natural sandstone cliffs

Composition

Percent of survey area: 2.3 percent
Cedarcreek soils—49 percent
Alticrest soils—7 percent
Grimsley soils—21 percent
Minor soils—23 percent

Soil Properties

Cedarcreek

Depth: Very deep
Drainage class: Well drained
Parent material: Mine spoil derived from sandstone, siltstone, shale, and coal
Textural class: Loamy-skeletal
Permeability: Moderately rapid

Alticrest

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from acid sandstone
Textural class: Coarse-loamy
Permeability: Moderately rapid

Grimsley

Depth: Deep
Drainage class: Well drained
Parent material: Colluvium derived from sandstone and shale
Textural class: Loamy-skeletal
Permeability: Moderately rapid

Minor soils

- Areas of moderately deep, well drained Berks soils on residual, shale shoulders and back slopes
- Areas of rock outcrops that occur as highwalls on ridges above benches on all landscapes of mountain slopes
- Areas of mine tipples, dumps, and tailings on various landscapes in the unit

Major Use: Woodland

Cropland and pasture

Suitability: Poorly suited to pasture in gently sloping to steep areas and not suited in very steep areas; not suited to cropland or hay
Major management factors: Slope, stones and boulders on the surface, and droughtiness

Woodland

Suitability: Well suited to poorly suited
Major management factors: Slope, droughtiness, and rock outcrops, especially on highwalls; stones and boulders on the surface

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Slope, seepage, and large stones

Building site development

Suitability: Fairly suited to not suited
Major management factors: Slope and large stones

10. Grimsley

Strongly sloping to very steep, well drained, deep soils formed in materials weathered from colluvium derived from sandstone and shale; on colluvial landforms

Setting

Topography: Back slopes and foot slopes
Physiography: Colluvial landforms in the Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Slope range: 8 to 70 percent
Drainage pattern: Dendritic
Surface features: Slopes of more than 35 percent on 86 percent of this unit

Composition

Percent of survey area: 4.9 percent
Grimsley soils—100 percent

Soil Properties

Grimsley

Depth: Deep
Drainage class: Well drained
Parent material: Colluvium derived from sandstone and shale
Textural class: Loamy-skeletal
Permeability: Moderately rapid

Use and Management

Major Use: Woodland

Cropland and pasture

Suitability: Poorly suited to not suited
Major management factors: Slope, stones and boulders on the surface, and droughtiness

Woodland

Suitability: Well suited to poorly suited
Major management factors: Slope, droughtiness, and stones and boulders on the surface

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Slope, seepage, and large stones

Building site development

Suitability: Fairly suited to not suited
Major management factors: Slope and large stones

11. Lily

Strongly sloping to very steep, well drained, moderately deep soils formed in materials weathered from acid sandstone; on ridges and spurs

Setting

Topography: Summits, shoulders, and back slopes (fig. 2)
Physiography: Uplands on the Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Slope range: 7 to 65 percent
Drainage pattern: Dendritic
Surface features: 57 percent of this unit on slopes of more than 35 percent

Composition

Percent of survey area: 5.6 percent
Lily soils—100 percent

Soil Properties

Lily

Depth: Moderately deep
Drainage class: Well drained
Parent material: Residuum derived from acid sandstone
Textural class: Fine-loamy
Permeability: Moderate

Use and Management

Major Use: Woodland

Cropland and pasture

Suitability: Moderately well suited to cropland and hay in gently and strongly sloping areas, well suited to pasture in gently sloping to moderately steep areas; not suited to these crops in very steep areas
Major management factors: Slope

Woodland

Suitability: Well suited to poorly suited
Major management factors: Slope, depth to bedrock, and an erosion hazard on steeper slopes

Sanitary facilities

Suitability: Poorly suited or not suited
Major management factors: Depth to bedrock and slope

Building site development

Suitability: Fairly suited to not suited
Major management factors: Depth to bedrock, slope

12. Udorthents-Urban land

Nearly level to moderately steep soils of variable color, texture, composition, and depth to bedrock in areas altered by human activity or covered by asphalt, concrete, and buildings

Setting

Topography: Various positions on the landscape
Physiography: Mainly lower back slopes to toe slopes in the Valley and Ridge province and in the Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section, but also on uplands
Slope range: 0 to 25 percent
Drainage pattern: Manmade drains on the contour
Surface features: Units include divided highways, commercial areas, and high density residential areas

Composition

Percent of survey area: 1.1 percent
Udorthents—60 percent
Urban land—40 percent

Soil Properties

Udorthents

Depth: Shallow to very deep
Drainage class: Somewhat poorly drained to well drained
Parent material: Limestone, sandstone, shale, and, in some places, intermingled coal fragments
Textural class: Variable
Permeability: Variable

Urban land

Depth: Variable
Material: Highways, streets, parking lots, and buildings in variable positions on the landscape

Minor soils

• Numerous areas of moderately deep to very deep, poorly drained to well drained, residual or colluvial soils on terraces, flood plains, or mine spoil; on various parts of the landscape

Use and Management

Major Use: Urban

Cropland and pasture

Suitability: Well suited only to garden plots in small areas to not suited in most areas
Major management factors: Urban land; on Udorthents, low natural fertility, droughtiness, acidity, and shallow depth to bedrock

Woodland

Suitability: Not suited
Major management factors: Urban land

Sanitary facilities

Suitability: Variable
Major management factors: Variable depth to bedrock, drainage, permeability, and availability of facilities

Building site development

Suitability: Variable
Major management factors: Variable depth to bedrock, drainage, texture, and permeability

Detailed Soil Map Units

The map units delineated on the detailed maps at the back of this survey 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. More information about each map unit is given under the heading "Use and Management of the Soils."

A map unit delineation on a 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 or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas 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 "included" areas that belong to other taxonomic classes.

Most included 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, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. 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 included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas 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 included areas 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, but if intensive use of small areas is planned, 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, Frederick silt loam, 2 to 7 percent slopes, is a phase of the Frederick 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. Berks-Weikert complex, 35 to 55 percent slopes, is an example.

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

Detailed map unit composition was decided by the following methods: *subjective judgment, informed judgment, modified statistical, (random or systematic points),* or *statistical (random or systematic points)*. *Subjective judgment* implies that 3 to 30 or more arbitrarily selected observations and less than 10 randomly selected observations are used to subjectively formulate map unit composition. The soil survey project staff relies mainly on impressions from field experience. *Informed judgment* implies that 3 to 30 or more arbitrarily selected observations and from 10 to 30 randomly selected observations are reviewed to determine map unit composition. The project staff combines this knowledge with impressions from field experience. *Modified statistics* implies that at least 30 random observations are recorded and the results are modified by the project staff's field experience. A *statistical* method implies that at least 30 random observations were recorded and composition is based on this data without modification. *Random points* are observations made without selection bias and are independent of any other observation. *Systematic points* are observations made on one or more fixed-interval line transects or grids, each line or grid being located without bias. Individual observations are not independent.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see "Tables" under "Contents") 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 or miscellaneous areas

Soil Descriptions

1A—Allegheny loam, 0 to 2 percent slopes

Composition (Subjective judgment)

Allegheny soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Terrace treads and risers
Landscape position: Toe slopes
Parent material: Alluvium derived from sandstone, shale, and limestone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 75 acres

Typical Profile

0 to 5 inches—dark yellowish brown loam
5 to 11 inches—brown fine sandy loam
11 to 24 inches—brown sandy clay loam
24 to 32 inches—brown gravelly sandy clay loam
32 to 61 inches—strong brown very gravelly sandy loam

Inclusions

Contrasting inclusions:
- Areas of Pope soils, which are well drained, are subject to flooding, and are on the lower parts of the landscape
- Areas of well drained, fine-loamy soils that are subject to flooding and that are on the lower parts of the landscape

Similar inclusions:
- Areas of well drained, coarse-loamy soils that are in positions on the landscape similar to those of the Allegheny soil

1B—Allegheny loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Allegheny soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Terrace treads and risers
Landscape position: Toe slopes
Parent material: Alluvium derived from sandstone, shale, and limestone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 50 acres

Typical Profile

0 to 5 inches—dark yellowish brown loam
5 to 11 inches—brown fine sandy loam
11 to 24 inches—brown sandy clay loam
24 to 32 inches—brown gravelly sandy clay loam
32 to 61 inches—strong brown very gravelly sandy loam

Inclusions

Contrasting inclusions:
- Areas of Pope soils, which are coarse-loamy, are subject to flooding, and are on the lower parts of the landscape
- Areas of well drained, fine-loamy soils that are subject to flooding and that are on the lower parts of the landscape

Similar inclusions:

• Areas of Allegheny soils on 7 to 15 percent slopes
• Areas of well drained, coarse-loamy soils in positions on the landscape similar to those of the Allegheny soil

2C—Alticrest fine sandy loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Alticrest soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 60 acres

Typical Profile

0 to 3 inches—dark brown fine sandy loam
3 to 35 inches—yellowish brown sandy loam
35 inches—unweathered sandstone

Inclusions

Contrasting inclusions:
• Areas of Gilpin soils, which are well drained, have more silt and less sand than the Alticrest soil, and are on the landscape with the Alticrest soil
• Areas of Grimsley soils, which are well drained, are in drainageways, have more rock fragments than the Alticrest soil, and are deeper to bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils that are 10 to 20 inches deep over bedrock and that are scattered throughout the map unit
• Areas of soils that are 40 to 60 inches deep over bedrock and that are scattered throughout the map unit

2D—Alticrest fine sandy loam, 15 to 25 percent slopes

Composition (Statistical method, random points)

Confidence interval: 80 percent
Alticrest soil and similar inclusions: 84 to 97 percent
Contrasting inclusions: 3 to 16 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 60 acres

Typical Profile

0 to 3 inches—dark brown fine sandy loam
3 to 35 inches—yellowish brown sandy loam
35 inches—unweathered sandstone

Inclusions

Contrasting inclusions:
• Areas of Gilpin soils, which are well drained, have more silt and less sand than the Alticrest soil, and are in landscape positions similar to those of the Alticrest soil
• Areas of Grimsley soils, which are well drained, are in drainageways, are deeper to bedrock, and have more rock fragments than the Alticrest soil
• Areas of soils that are deeper than 40 inches to bedrock and that have more clay than the Alticrest soil
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Lily soils, which have more clay than the Alticrest soil and are in landscape positions similar to those of the Alticrest soil
• Areas of residual, shale soils that are 10 to 20 inches deep to bedrock and that are in landscape positions similar to those of the Alticrest soil
• Areas of residual soils that are 40 to 60 inches deep to bedrock and that are in landscape positions similar to those of the Alticrest soil

2E—Alticrest fine sandy loam, 25 to 40 percent slopes

Composition (Statistical method, random points)

Confidence interval: 90 percent
Alticrest soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 150 acres

Typical Profile

0 to 3 inches—dark brown fine sandy loam
3 to 35 inches—yellowish brown sandy loam
35 inches—unweathered sandstone

Inclusions

Contrasting inclusions:
• Areas of Gilpin soils, which formed in residuum derived from shale, have more silt and less sand than the Alticrest soil, and are in landscape positions similar to those of the Alticrest soil
• Areas of Grimsley soils, which are colluvial, are in drainageways, are 40 to 60 inches deep to bedrock, and have more rock fragments than those in the Alticrest soil
• Areas of moderately well drained soils, in swales, that are more than 40 inches deep to bedrock
• Areas of residual, shale soils that are 10 to 20 inches deep over bedrock and that are in landscape positions similar to those of the Alticrest soil
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Berks soils, which formed in residuum derived from shale, have more shale fragments than the Alticrest soil, and are in landscape positions similar to those of the Alticrest soil
• Areas of Lily soils, which have more clay than the Alticrest soil and are in landscape positions similar to those of the Alticrest soil
• Areas of Wallen soils, which have more rock fragments than the Alticrest soil and that are in landscape positions similar to those of the Alticrest soil

3C—Berks-Weikert complex, 7 to 15 percent slopes

Composition (Subjective judgment)

Berks soil and similar inclusions: 45 to 55 percent
Weikert soil and similar inclusions: 30 to 40 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits and shoulders
Parent material: Acid shale
Shape of areas: Irregular, or very long and broad
Size of areas: 5 to 50 acres

Typical Profile

Berks

0 to 6 inches—yellowish brown channery silt loam
6 to 14 inches—yellowish brown very channery silt loam
14 to 24 inches—yellowish brown extremely channery silty clay loam
24 to 33 inches—yellowish brown extremely channery silt loam
33 inches—weathered shale

Weikert

0 to 7 inches—yellowish brown channery silt loam
7 to 12 inches—yellowish brown very channery silt loam
12 to 19 inches—yellowish brown extremely channery silt loam
19 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep, are in drainageways, and have sandstone fragments
• Areas of rock outcrops scattered throughout the unit
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep to bedrock, that have more clay and fewer rock fragments than the Berks and Weikert soils, and that are intermingled in the map unit with the Berks and Weikert soils, especially in saddles

3D—Berks-Weikert complex, 15 to 35 percent slopes

Composition (Subjective judgment)

Berks soil and similar inclusions: 45 to 55 percent
Weikert soil and similar inclusions: 30 to 40 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid shale
Shape of areas: Irregular, or very long and broad
Size of areas: 5 to 50 acres

Typical Profile

Berks

0 to 6 inches—yellowish brown channery silt loam
6 to 14 inches—yellowish brown very channery silt loam

14 to 24 inches—yellowish brown extremely channery silty clay loam
24 to 33 inches—yellowish brown extremely channery silt loam
33 inches—weathered shale

Weikert

0 to 7 inches—yellowish brown channery silt loam
7 to 12 inches—yellowish brown very channery silt loam
12 to 19 inches—yellowish brown extremely channery silt loam
19 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep and colluvial, are in drainageways, and have sandstone fragments
• Areas of rock outcrops scattered throughout the unit
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep to bedrock, that have more clay and fewer rock fragments than the Berks and Weikert soils, and that are intermingled with the Berks and Weikert soils in the map unit, especially in saddles

3E—Berks-Weikert complex, 35 to 55 percent slopes

Composition (Statistical method, random points)

Confidence interval: 90 percent
Berks soil and similar inclusions: 49 to 65 percent
Weikert soil and similar inclusions: 26 to 42 percent
Contrasting inclusions: 4 to 13 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid shale
Shape of areas: Irregular, or very long and broad
Size of areas: 10 to 3,000 acres

Typical Profile

Berks

0 to 6 inches—yellowish brown channery silt loam
6 to 14 inches—yellowish brown very channery silt loam
14 to 24 inches—yellowish brown extremely channery silty clay loam
24 to 33 inches—yellowish brown extremely channery silt loam
33 inches—weathered shale

Weikert

0 to 7 inches—yellowish brown channery silt loam
7 to 12 inches—yellowish brown very channery silt loam
12 to 19 inches—yellowish brown extremely channery silt loam
19 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep and colluvial, are in drainageways, and have sandstone fragments
• Areas of Wallen soils, which formed in sandstone, have sandstone fragments, and are on the higher parts of the landscape
• Areas of soils, scattered throughout the map unit, that are less than 10 inches deep to bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils that have fewer shale fragments throughout the profile than the Berks and Weikert soils
• Areas of soils that are 40 to 60 inches deep to bedrock, that have more clay and fewer rock fragments than the Berks and Weikert soils, and that are intermingled with the Berks and Weikert soils in the map unit, especially in saddles

4E—Berks-Gilpin complex, 25 to 35 percent slopes

Composition (Statistical method, random points)

Confidence interval: 90 percent
Berks soil and similar inclusions: 35 to 60 percent
Gilpin soil and similar inclusions: 29 to 53 percent
Contrasting inclusions: 3 to 19 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Noncalcareous shale
Shape of areas: Irregular, or very long and broad
Size of areas: 5 to 75 acres

Typical Profile

Berks

0 to 4 inches—dark brown channery silt loam

4 to 14 inches—dark yellowish brown channery silt loam
14 to 33 inches—strong brown very channery silt loam
33 inches—weathered shale

Gilpin

0 to 2 inches—dark brown silt loam
2 to 6 inches—yellowish brown silt loam
6 to 30 inches—strong brown silty clay loam
30 to 35 inches—yellowish brown very channery silt loam
35 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Cedarcreek soils, which are very deep and in mined areas
• Areas of Grimsley soils, which are deep and colluvial, have sandstone fragments, and are in drainageways and on the lower foot slopes
• Areas of soils, scattered throughout the unit, that are less than 20 inches deep over bedrock and that have more sand than the Berks and Gilpin soils
• Areas of soils, scattered throughout the unit, that are more than 40 inches deep over bedrock and that have more sand than the Berks and Gilpin soils
• Areas of rock outcrops that are scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, which formed in residuum derived from sandstone and have more sand, less silt, and fewer rock fragments than the Berks soil
• Areas of Lily soils, which formed in residuum derived from sandstone and have more sand and less silt than the Gilpin soil
• Areas of Wallen soils, which formed in residuum derived from sandstone, have sandstone fragments, and have more sand than the Berks soil
• Areas of soils that are 40 to 60 inches deep to bedrock, have shale fragments, and are scattered throughout the map unit, especially in saddles and on summits

4F—Berks-Gilpin complex, 35 to 70 percent slopes

Composition (Statistical method, random points)

Confidence interval: 90 percent
Berks soil and similar inclusions: 56 to 73 percent
Gilpin soil and similar inclusions: 23 to 40 percent
Contrasting inclusions: 0 to 7 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Noncalcareous shale
Shape of areas: Irregular, or very long and broad
Size of areas: 5 to 300 acres

Typical Profile

Berks
0 to 4 inches—dark brown channery silt loam
4 to 14 inches—dark yellowish brown channery silt loam
14 to 33 inches—strong brown very channery silt loam
33 inches—weathered shale

Gilpin

0 to 2 inches—dark brown silt loam
2 to 6 inches—yellowish brown silt loam
6 to 30 inches—strong brown silty clay loam
30 to 35 inches—yellowish brown very channery silt loam
35 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Cedarcreek soils, which are very deep and are in mined areas
• Areas of Grimsley soils, which are deep and colluvial , have sandstone fragments, and are in drainageways and on the lower foot slopes
• Areas of soils that are less than 20 inches deep over bedrock, that have more sand than the Berks and Gilpin soils, and that are scattered throughout the map unit
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, which formed in residuum derived from sandstone and have more sand, less silt, and fewer rock fragments than the Berks soil
• Areas of Lily soils that formed in residuum derived from sandstone and that have more sand and less silt than those in the Gilpin soil
• Areas of Wallen soils that formed in residuum derived from sandstone, that have sandstone fragments, and that have more sand than the Berks soil
• Areas of soils that are 40 to 60 inches deep to bedrock, that have shale fragments, and that are scattered throughout the map unit, especially in saddles and on summits
• Areas of soils that are 10 to 20 inches deep over bedrock, that have shale fragments, and that are scattered throughout the map unit

5D—Bland-Rock outcrop complex, 15 to 25 percent slopes

Composition (Subjective judgment)

Bland soil and similar inclusions: 75 to 85 percent
Rock outcrop: 10 to 20 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills and foot slopes on spurs
Parent material: Argillaceous, red limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 150 acres

Typical Profile

0 to 4 inches—reddish gray silty clay loam
4 to 18 inches—reddish brown silty clay
18 to 30 inches—weak red silty clay
30 to 36 inches—dusky red channery clay
36 inches—argillaceous limestone

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which formed in shale, have less clay and more rock fragments than the Bland soil, and are in landscape positions higher than those of the Bland soil
• Areas of Poplimento soils, which are very deep, formed in shale, and are in landscape positions higher than those of the Bland soil
• Areas of Westmoreland soils, which are moderately deep, formed in shale, have less clay than that in the Bland soil, and are in landscape positions higher than those of the Bland soil
• Areas of poorly drained soils in narrow drainageways
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep to bedrock and that are scattered throughout the map unit
• Areas of soils that are 10 to 20 inches deep to bedrock and that are scattered throughout the map unit

5E—Bland-Rock outcrop complex, 25 to 50 percent slopes

Composition (Informed judgment)

Bland soil and similar inclusions: 75 to 85 percent
Rock outcrops: 10 to 20 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills and foot slopes on spurs
Parent material: Argillaceous, red limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 200 acres

Typical Profile

0 to 4 inches—reddish gray silty clay loam
4 to 18 inches—reddish brown silty clay
18 to 30 inches—weak red silty clay
30 to 36 inches—dusky red channery clay
36 inches—argillaceous limestone

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which formed in shale, have less clay and more rock fragments than the Bland soil, and are in landscape positions higher than those of the Bland soil
• Areas of Poplimento soils, which are very deep, formed in shale, and are in landscape positions higher than those of the Bland soil
• Areas of Westmoreland soils, which are moderately deep, formed in shale, have less clay than that in the Bland soil, and are in landscape positions higher than those of the Bland soil
• Areas of poorly drained soils in narrow drainageways
Similar inclusions:
• Areas of soils that are more than 40 inches deep over bedrock and that are scattered throughout the map unit
• Areas of soils that are less than 20 inches deep over bedrock and that are scattered throughout the map unit

6B—Bland silty clay loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Bland soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills and spurs
Landscape position: Summits and shoulders on hills and foot slopes on spurs
Parent material: Argillaceous, red limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 40 acres

Typical Profile

0 to 4 inches—reddish gray silty clay loam
4 to 18 inches—reddish brown silty clay
18 to 30 inches—weak red silty clay
30 to 36 inches—dusky red channery clay
36 inches—argillaceous limestone

Inclusions

Contrasting inclusions:
• Areas of rock outcrops scattered throughout the map unit
• Areas of poorly drained soils in narrow drainageways
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep over bedrock and that are intermingled with the Bland soil in the map unit
• Areas of soils that are 10 to 20 inches deep over bedrock and that are intermingled with the Bland soil in the map unit

6C—Bland silty clay loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Bland soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills and spurs
Landscape position: Summits and shoulders on hills and foot slopes on spurs
Parent material: Argillaceous, red limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 50 acres

Typical Profile

0 to 4 inches—reddish gray silty clay loam
4 to 18 inches—reddish brown silty clay
18 to 30 inches—weak red silty clay
30 to 36 inches—dusky red channery clay
36 inches—argillaceous limestone

Inclusions

Contrasting inclusions:
• Areas of rock outcrop scattered throughout the map unit
• Areas of poorly drained soils in narrow drainageways
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep over bedrock and that are intermingled with the Bland soil in the map unit
• Areas of soils that are 10 to 20 inches deep over bedrock and that are intermingled with the Bland soil in the map unit

6D—Bland silty clay loam, 15 to 25 percent slopes

Composition (Subjective judgment)

Bland soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills and foot slopes on spurs
Parent material: Argillaceous, red limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 60 acres

Typical Profile

0 to 4 inches—reddish gray silty clay loam
4 to 18 inches—reddish brown silty clay
18 to 30 inches—weak red silty clay
30 to 36 inches—dusky red channery clay
36 inches—argillaceous limestone

Inclusions

Contrasting inclusions:
• Areas of rock outcrops scattered throughout the map unit
• Areas of poorly drained soils in narrow drainageways
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep to bedrock and that are intermingled with the Bland soil in the map unit
• Areas of soils that are 10 to 20 inches deep to bedrock and that are intermingled with the Bland soil in the map unit

7C—Botetourt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Botetourt soil and similar inclusions: 95 to 100 percent
Contrasting inclusions: 0 to 5 percent

Setting

Landform: Terrace risers
Landscape position: Toe slopes
Parent material: Alluvium derived from sandstone, shale, quartzite, and limestone
Shape of areas: Irregular, or short and narrow
Size of areas: 4 acres

Typical Profile

0 to 7 inches, dark yellowish brown loam

7 to 18 inches, yellowish brown loam
18 to 37 inches, yellowish brown clay loam that has light gray iron depletions
37 to 62 inches, yellowish brown gravelly loam that has light gray iron depletions

Inclusions

Contrasting inclusions:
• Areas of Wolfgap soils, which are well drained, are on the lower parts of the landscape, and are subject to flooding
Similar inclusions:
• Areas of Coursey soils, which are moderately well drained, have a lower base saturation than the Botetourt soil, and are in landscape positions similar to those of the Botetourt soil

8D—Brushy gravelly silt loam, 15 to 25 percent slopes

Composition (Subjective judgment)

Brushy soil and similar inclusions: 70 to 80 percent
Contrasting inclusions: 20 to 30 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes of hills and back slopes of spurs
Parent material: Cherty limestone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 3 to 35 acres

Typical Profile

0 to 4 inches—dark grayish brown gravelly loam
4 to 10 inches—dark yellowish brown very gravelly loam
10 to 23 inches—yellowish brown very gravelly loam
23 inches—cherty limestone

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which have shale fragments and are in landscape positions similar to those of the Brushy soil
• Areas of Murrill soils, which are very deep, have fewer rock fragments than the Brushy soil, formed in colluvium, and are in drainageways and on side slopes
• Areas of Oriskany soils, which are very deep and colluvial, have sandstone fragments, and are in drainageways and on side slopes
• Areas of Weikert soils, which are shallow, formed in residuum derived from shale, and are in landscape positions similar to those of the Brushy soil
Similar inclusions:
• Areas of moderately deep soils that have fewer rock fragments than those in the Brushy soil and that are in landscape positions similar to those of the Brushy soil

8E—Brushy gravelly silt loam, 25 to 60 percent slopes

Composition (Statistical method, systematic points)

Confidence interval: 80 percent
Brushy soil and similar inclusions: 73 to 89 percent
Contrasting inclusions: 11 to 27 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes of hills and back slopes of spurs
Parent material: Cherty limestone
Shape of areas: Irregular, or long and narrow to broad
Size of areas: 5 to 450 acres

Typical Profile

0 to 4 inches—dark grayish brown gravelly loam
4 to 10 inches—dark yellowish brown very gravelly loam
10 to 23 inches—yellowish brown very gravelly loam
23 inches—cherty limestone

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep and colluvial, have sandstone fragments, and are in drainageways and on side slopes
• Areas of Wallen soils, which formed in residuum of sandstone, have sandstone fragments, and are on shoulders and side slopes in higher positions than those of the Brushy soil
• Areas of Lily soils that formed in residuum of sandstone, that have fewer rock fragments than those in the Brushy soil, and that are on shoulders and side slopes in higher positions than those of the Brushy soil
• Areas of deep soils, on interfluves, that have more clay and fewer rock fragments than those in the Brushy soil
• Areas of outcrops of cherty limestone
Similar inclusions:
• Areas of soils that have fewer rock fragments than those in the Brushy soil and that are in landscape positions similar to those of the Brushy soil
• Areas of soils that are 10 to 20 inches deep to bedrock and that are in positions on the landscape similar to those of the Brushy soil

• Areas of soils where sandstone channers are on the surface

9D—Calvin channery silt loam, 15 to 35 percent slopes

Composition (Informed judgment)

Calvin soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid, red shale
Shape of areas: Irregular, or long and broad
Size of areas: 10 to 50 acres

Typical Profile

0 to 8 inches—reddish brown channery silt loam
8 to 25 inches—reddish brown very channery silt loam
25 to 32 inches—reddish brown extremely channery silt loam
32 inches—unweathered shale

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep and colluvial, are in drainageways, formed in bedrock, and have sandstone fragments
• Areas of Poplimento soils, which are very deep, have more clay and fewer rock fragments than the Calvin soil, and are in the lower landscape positions of the map unit
• Areas of Wallen soils, which have more sand and less silt than the Calvin soil, are yellower than the Calvin soil, and are in the upper landscape positions of the map unit
• Areas of Westmoreland soils, which are deep, have more clay and fewer rock fragments than the Calvin soil, and are in the lower landscape positions of the map unit
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Berks soils, which are yellower than the Calvin soil and are in the lower landscape positions of the map unit
• Areas of Calvin silt loam scattered throughout the map unit
• Areas of very stony Calvin channery silt loam in the upper landscape positions of the map unit
• Areas of soils that are 10 to 20 inches deep to bedrock and that are scattered throughout the map unit
• Areas of soils that are 40 to 60 inches deep to bedrock and that are scattered throughout the map unit

9E—Calvin channery silt loam, 35 to 55 percent slopes

Composition (Statistical method, random points)

Confidence interval: 80 percent
Calvin soil and similar inclusions: 78 to 93 percent
Contrasting inclusions: 7 to 22 percent

Setting

Landform: Ridges
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid, red shale
Shape of areas: Irregular, or long and broad
Size of areas: 15 to 600 acres

Typical Profile

0 to 8 inches—reddish brown channery silt loam
8 to 25 inches—reddish brown very channery silt loam
25 to 32 inches—reddish brown extremely channery silt loam
32 inches—unweathered shale

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep and colluvial, are in drainageways, and have sandstone fragments
• Areas of Poplimento soils, which are very deep, have more clay and fewer rock fragments than the Calvin soil, and are in the lower landscape positions of the map unit
• Areas of Wallen soils, which have more sand and less silt than the Calvin soil, are yellower than the Calvin soil, and are in the upper landscape positions of the map unit
• Areas of Westmoreland soils, which are deep, have more clay and fewer rock fragments than the Calvin soil, and are in the lower landscape positions of the map unit
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Berks soils, which are yellower than the Calvin soil and are in the lower landscape positions of the map unit

• Areas of Calvin silt loam scattered throughout the map unit
• Areas of very stony Calvin channery silt loam in the upper landscape positions of the map unit
• Areas of soils that are 10 to 20 inches deep to bedrock and that are scattered throughout the map unit
• Areas of soils that are 40 to 60 inches deep to bedrock and that are scattered throughout the map unit

10D—Calvin channery silt loam, 15 to 35 percent slopes, very stony

Composition (Subjective judgment)

Calvin soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid, red shale
Shape of areas: Irregular, or long and broad
Size of areas: 10 to 40 acres

Typical Profile

0 to 8 inches—reddish brown very stony silt loam
8 to 25 inches—reddish brown very channery silt loam
25 to 32 inches—reddish brown extremely channery silt loam
32 inches—unweathered shale

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep, are in drainageways, and have sandstone fragments
• Areas of Poplimento soils, which are very deep, are in the lower areas of the map unit, and have more clay and fewer rock fragments than the Calvin soil
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Berks soils, which are yellower than the Calvin soil and are in the lower landscape positions of the map unit
• Areas of Calvin silt loam scattered throughout the map unit
• Areas of Calvin channery silt loam scattered throughout the map unit
• Areas of Wallen soils, which formed in residuum derived from sandstone, have more sand and less silt than the Calvin soil, are yellower than the Calvin soil, and are in the higher landscape positions of the map unit
• Areas of Westmoreland soils, which are deep, have more clay and fewer rock fragments than the Calvin soil, and are in the lower landscape positions in the map unit
• Areas of soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

10E—Calvin channery silt loam, 35 to 55 percent slopes, very stony

Composition (Subjective judgment)

Calvin soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid, red shale
Shape of areas: Irregular, or long and broad
Size of areas: 20 to 750 acres

Typical Profile

0 to 8 inches—reddish brown very stony silt loam
8 to 25 inches—reddish brown very channery silt loam
25 to 32 inches—reddish brown extremely channery silt loam
32 inches—unweathered shale

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep, are in drainageways, and have sandstone fragments
• Areas of Poplimento soils, which are very deep, have more clay and fewer rock fragments than the Calvin soil, and are in the lower landscape positions of the map unit
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Berks soils, which are yellower than the Calvin soil and are in the lower landscape positions of the map unit
• Areas of Calvin silt loam scattered throughout the map unit
• Areas of Calvin channery silt loam scattered throughout the map unit
• Areas of Wallen soils, which formed in residuum derived from sandstone, have more sand and less silt and are yellower than the Calvin soil, and are in the upper landscape positions of the map unit

• Areas of Westmoreland soils, which are deep, have more clay and fewer rock fragments than the Calvin soil, and are in the lower landscape positions of the map unit
• Areas of soils that are 10 to 20 inches deep to bedrock and that are scattered throughout the map unit
• Areas of soils that are 40 to 60 inches deep to bedrock and that are scattered throughout the map unit

11C—Carbo silt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Carbo soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills and spurs
Landscape position: Summits and shoulders on hills and foot slopes on spurs
Parent material: Residuum derived from limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 40 acres

Typical Profile

0 to 5 inches—dark brown silt loam
5 to 12 inches—strong brown silty clay loam
12 to 34 inches—strong brown clay
34 inches—limestone

Inclusions

Contrasting inclusions:
• Areas of Pisgah and Poplimento soils, which are very deep and are scattered throughout the map unit
• Areas of soils, near rock outcrops, that are 10 to 20 inches deep over bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Carbo soils on slopes of 2 to 7 percent
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

11D—Carbo silt loam, 15 to 25 percent slopes

Composition (Subjective judgment)

Carbo soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills and foot slopes on spurs
Parent material: Residuum derived from limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 65 acres

Typical Profile

0 to 5 inches—dark brown silt loam
5 to 12 inches—strong brown silty clay loam
12 to 34 inches—strong brown clay
34 inches—limestone

Inclusions

Contrasting inclusions:
• Areas of Pisgah and Poplimento soils, which are very deep and are scattered throughout the map unit
• Areas of soils, near rock outcrops, that are 10 to 20 inches deep over bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

11E—Carbo silt loam, 25 to 35 percent slopes

Composition (Subjective judgment)

Carbo soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills; back slopes and foot slopes on spurs
Parent material: Residuum derived from limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 60 acres

Typical Profile

0 to 5 inches—dark brown silt loam
5 to 12 inches—strong brown silty clay loam
12 to 34 inches—strong brown clay
34 inches—limestone

Inclusions

Contrasting inclusions:
• Areas of Pisgah and Poplimento soils, which are very deep and are scattered throughout the map unit

• Areas of soils, near rock outcrops, that are 10 to 20 inches deep to bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

11F—Carbo silt loam, 35 to 65 percent slopes

Composition (Subjective judgment)

Carbo soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills; back slopes and foot slopes on spurs
Parent material: Residuum derived from limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 50 acres

Typical Profile

0 to 5 inches—dark brown silt loam
5 to 12 inches—strong brown silty clay loam
12 to 34 inches—strong brown clay
34 inches—limestone

Inclusions

Contrasting inclusions:
• Areas of Pisgah and Poplimento soils, which are very deep and are scattered throughout the map unit
• Areas of soils, near rock outcrops, that are 10 to 20 inches deep over bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

12D—Carbo-Rock outcrop complex, 7 to 25 percent slopes

Composition (Modified statistical method, random points)

Confidence interval: 80 percent
Carbo soil and similar inclusions: 75 to 90 percent
Rock outcrops: 10 to 20 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills and foot slopes on spurs
Parent material: Limestone
Shape of areas: Small and irregular to long and narrow
Size of areas: 5 to 100 acres

Typical Profile

0 to 5 inches—dark brown silt loam
5 to 12 inches—strong brown silty clay loam
12 to 34 inches—strong brown clay
34 inches—hard limestone

Inclusions

Contrasting inclusions:
• Areas of Frederick soils, which are very deep and are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of Murrill soils, which are very deep and colluvial and are on the lower landscapes of the map unit
• Areas of Newbern soils, which are shallow and loamy and are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of Oriskany soils, which are very deep and colluvial and are in drainageways
• Areas of poorly drained soils in narrow drainageways
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep over bedrock and that are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of soils that are less than 20 inches deep over bedrock and that are intermingled with the Carbo soil and Rock outcrop in the map unit

12E—Carbo-Rock outcrop complex, 25 to 65 percent slopes

Composition (Modified statistical method, random points)

Confidence interval: 90 percent
Carbo soil and similar inclusions: 67 to 84 percent
Rock outcrops: 10 to 20 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills and back slopes and foot slopes on spurs
Parent material: Limestone

Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 500 acres

Typical Profile

0 to 5 inches—dark brown silt loam
5 to 12 inches—strong brown silty clay loam
12 to 34 inches—strong brown clay
34 inches—limestone

Inclusions

Contrasting inclusions:
• Areas of Frederick soils, which are very deep and are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of Newbern soils, which are shallow and loamy and are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of Oriskany soils, which are very deep and colluvial and are in drainageways
• Areas of poorly drained soils in narrow drainageways
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep over bedrock and that are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of soils that are less than 20 inches deep over bedrock and that are intermingled with the Carbo soil and Rock outcrop in the map unit

13E—Carbo-Rock outcrop complex, karst, 7 to 65 percent slopes

Composition (Informed judgment)

Carbo soil and similar inclusions: 60 to 70 percent
Rock outcrops: 15 to 25 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes on hills and back slopes and foot slopes on spurs (fig. 4)
Parent material: Limestone
Shape of areas: Small and irregular to long and broad
Size of areas: 5 to 300 acres

Typical Profile

0 to 5 inches—dark brown silt loam
5 to 12 inches—strong brown silty clay loam
12 to 34 inches—strong brown clay
34 inches—limestone

Inclusions

Contrasting inclusions:
• Areas of Frederick soils, which are very deep and are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of poorly drained soils in narrow drainageways and in the center of some of the numerous sinkholes in the map unit
Similar inclusions:
• Areas of soils that are 40 to 60 inches deep over bedrock and that are intermingled with the Carbo soil and Rock outcrop in the map unit
• Areas of soils that are less than 20 inches deep over bedrock and that are intermingled with the Carbo soil and Rock outcrop in the map unit

14C—Cedarcreek-Alticrest-Rock outcrop complex, 5 to 15 percent slopes, very stony

Composition (Subjective judgment)

Cedarcreek soil and similar inclusions: 45 to 50 percent
Alticrest soil and similar inclusions: 25 to 30 percent
Rock outcrop from old strip mine highwalls: 10 to 15 percent
Contrasting inclusions: 5 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits and shoulders
Parent material: Mine spoil and sandstone
Shape of areas: Irregular, or very long and broad
Size of areas: 10 to 30 acres

Typical Profile

Cedarcreek

0 to 4 inches—very dark grayish brown very stony loam
4 to 26 inches—dark grayish brown and dark yellowish brown extremely stony loam
26 to 58 inches—yellowish brown extremely stony loam
58 to 72 inches—dark grayish brown very gravelly loam

Alticrest

0 to 3 inches—dark brown fine sandy loam
3 to 35 inches—yellowish brown sandy loam
35 inches—unweathered sandstone

Rock outcrop

Highwalls of strip mines

Figure 4.—Pasture on the Carbo-Rock outcrop complex, karst, 7 to 65 percent slopes.

Inclusions

Contrasting inclusions:

- Areas of Gilpin soils, which are moderately deep, formed in residuum derived from shale, have fewer rock fragments than those in the Cedarcreek soil, have more clay and less sand than the Alticrest soil, and are scattered throughout the residual parts of the map unit
- Areas of Grimsley soils, which are deep and colluvial , are in drainageways and on foot slopes, and have more clay in the subsoil than the Alticrest soil

Similar inclusions:

- Areas of Berks soils, which are moderately deep, formed in residuum derived from shale, have more shale fragments than the Alticrest soil, and are scattered throughout the residual parts of the map unit
- Areas of Lily soils, which are moderately deep, have more clay and less sand in the subsoil than the Alticrest soil, and are scattered throughout the residual parts of the map unit

14E—Cedarcreek-Alticrest-Rock outcrop complex, 15 to 40 percent slopes, very stony

Composition (Informed judgment)

Cedarcreek soil and similar inclusions: 45 to 50 percent
Alticrest soil and similar inclusions: 25 to 30 percent
Rock outcrop from highwalls of old strip mines: 10 to 15 percent
Contrasting inclusions: 5 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits and shoulders
Parent material: Mine spoil and sandstone
Shape of areas: Irregular, or very long and broad
Size of areas: 10 to 300 acres

Typical Profile

Cedarcreek

0 to 4 inches—very dark grayish brown very stony loam
4 to 26 inches—dark grayish brown and dark yellowish brown extremely stony loam
26 to 58 inches—yellowish brown extremely stony loam
58 to 72 inches—dark grayish brown very gravelly loam

Alticrest

0 to 3 inches—dark brown fine sandy loam
3 to 35 inches—yellowish brown sandy loam
35 inches—unweathered sandstone

Rock outcrops

Highwalls of strip mines

Inclusions

Contrasting inclusions:
• Areas of Gilpin soils, which are moderately deep, formed in residuum derived from shale, have fewer rock fragments than the Cedarcreek soil, have more clay and less sand than the Alticrest soil, and are scattered among the residual soils in the map unit
• Areas of Grimsley soils, which are deep and colluvial , are in drainageways and on foot slopes, and have more clay in the subsoil than the Alticrest soil
Similar inclusions:
• Areas of Berks soils, which are moderately deep, formed in residuum derived from shale, have more shale fragments than the Alticrest soil, and are scattered among the residual soils in the map unit
• Areas of Lily soils, which are moderately deep, are scattered among the residual soils in the map unit, and have more clay and less sand in the subsoil than the Alticrest soil

15C—Cedarcreek-Rock outcrop complex, 0 to 15 percent slopes, very stony

Composition (Subjective judgment)

Cedarcreek soil and similar inclusions: 75 to 85 percent
Rock outcrop: 10 to 15 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Mountains and hills
Landscape position: Summits, shoulders, back slopes, and some foot slopes
Parent material: Mine spoil from sandstone, siltstone, shale, and coal
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 60 acres

Typical Profile

Cedarcreek
0 to 4 inches—very dark grayish brown very stony loam
4 to 26 inches—dark grayish brown and dark yellowish brown stony loam
26 to 58 inches—yellowish brown stony loam
58 to 72 inches—dark grayish brown very gravelly loam

Rock outcrop
Highwalls of strip mines

Inclusions

Contrasting inclusions:
• Areas of Alticrest, Berks, Gilpin, and Lily soils, which are well drained, are in unmined areas on the landscape, and are less than 40 inches deep to bedrock
• Areas of Grimsley soils, which are well drained, are in drainageways and on foot slopes, and have a natural subsoil
• Areas of residual soils less than 20 inches deep over bedrock
• Areas of residual soils more than 40 inches deep over bedrock
Similar inclusions:
• Areas of strip mine soils that have a higher pH in the subsoil than typical for the Cedarcreek soil

15D—Cedarcreek-Rock outcrop complex, 15 to 35 percent slopes, very stony

Composition (Subjective judgment)

Cedarcreek soil and similar inclusions: 75 to 85 percent
Rock outcrop on highwalls of strip mines: 10 to 15 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Mountains and hills
Landscape position: Summits, shoulders, back slopes, and some foot slopes
Parent material: Mine spoil from sandstone, siltstone, shale, and coal
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 60 acres

Typical Profile

0 to 4 inches—very dark grayish brown very stony loam
4 to 26 inches—dark grayish brown and dark yellowish brown stony loam
26 to 58 inches—yellowish brown stony loam
58 to 72 inches—dark grayish brown very gravelly loam

Rock outcrop

Highwalls of strip mines

Inclusions

Contrasting inclusions:
• Areas of Alticrest, Berks, Gilpin, and Lily soils, which are well drained, are in unmined areas of the landscape, and are less than 40 inches deep to bedrock
• Areas of Grimsley soils, which are well drained, are in drainageways and on foot slopes, and have a natural subsoil
• Areas of residual soils that are less than 20 inches deep to bedrock
• Areas of residual soils that are more than 40 inches deep to bedrock
Similar inclusions:
• Areas of strip mine soils that have a higher pH in the subsoil than typical for the Cedarcreek soil

15E—Cedarcreek-Rock outcrop complex, 35 to 80 percent slopes, very stony

Composition (Informed judgment)

Cedarcreek soil and similar inclusions: 75 to 85 percent
Rock outcrop on highwalls of strip mines: 10 to 15 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Mountains and hills
Landscape position: Summits, shoulders, back slopes, and scattered foot slopes
Parent material: Mine spoil from sandstone, siltstone, shale, and coal
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 60 acres

Typical Profile

0 to 4 inches—very dark grayish brown very stony loam
4 to 26 inches—dark grayish brown and dark yellowish brown stony loam
26 to 58 inches—yellowish brown stony loam
58 to 72 inches—dark grayish brown very gravelly loam

Rock outcrop

Highwalls of strip mines

Inclusions

Contrasting inclusions:
• Areas of Alticrest, Berks, Gilpin, and Lily soils, which are well drained, are in unmined areas of the landscape, and are less than 40 inches deep to bedrock
• Areas of Grimsley soils, which are well drained, are in drainageways and on foot slopes, and have a natural subsoil
• Areas of residual soils less than 20 inches deep over bedrock
• Areas of residual soils more than 40 inches deep over bedrock
Similar inclusions:
• Areas of strip mine soils that have a higher pH in the subsoil than typical for the Cedarcreek soil

16D—Chiswell-Litz complex, 15 to 25 percent slopes

Composition (Subjective judgment)

Chiswell soil and similar inclusions: 55 to 65 percent
Litz soil and similar inclusions: 30 to 40 percent
Contrasting inclusions: 0 to 15 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, back slopes, and some foot slopes
Parent material: Shale interbedded with fine grained sandstone, siltstone, and limestone
Shape of areas: Long and narrow, or irregular
Size of areas: 3 to 30 acres

Typical Profile

Chiswell

0 to 2 inches—dark brown silt loam
2 to 11 inches—yellowish brown channery silt loam
11 to 14 inches—yellowish brown very channery silt loam
14 to 17 inches—yellowish brown extremely channery silt loam
17 to 20 inches—olive brown weathered shale
20 inches—shale

Litz

0 to 5 inches—brown channery loam
5 to 11 inches—yellowish brown channery loam
11 to 26 inches—dark yellowish brown very channery loam and strong brown very channery clay loam
26 inches—shale

Inclusions

Contrasting inclusions:
- Areas of Carbo soils near the edge of the map unit
- Areas of rock outcrops scattered throughout the map unit

Similar inclusions:
- Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock
- Areas of soils, scattered throughout the map unit, that have fewer rock fragments than in the Chiswell and Litz soils

16E—Chiswell-Litz complex, 25 to 35 percent slopes

Composition (Subjective judgment)

Chiswell soil and similar inclusions: 55 to 65 percent
Litz soil and similar inclusions: 30 to 40 percent
Contrasting inclusions: 0 to 15 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent material: Shale interbedded with fine grained sandstone, siltstone, and limestone
Shape of areas: Long and narrow, or irregular
Size of areas: 3 to 50 acres

Typical Profile

Chiswell

0 to 2 inches—dark brown silt loam
2 to 11 inches—yellowish brown channery silt loam
11 to 14 inches—yellowish brown very channery silt loam
14 to 17 inches—yellowish brown extremely channery silt loam
17 to 20 inches—olive brown weathered shale
20 inches—shale

Litz

0 to 5 inches—brown channery loam
5 to 11 inches—yellowish brown channery loam
11 to 26 inches—dark yellowish brown very channery loam and strong brown very channery clay loam
26 inches—shale

Inclusions

Contrasting inclusions:
- Areas of Carbo soils near the edges of the map unit
- Areas of very shallow soils near rock outcrops
- Areas of rock outcrops scattered throughout the map unit

Similar inclusions:
- Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock
- Areas of soils, scattered throughout the map unit, that have fewer rock fragments

16F—Chiswell-Litz complex, 35 to 60 percent slopes

Composition (Subjective judgment)

Chiswell soil and similar inclusions: 55 to 65 percent
Litz soil and similar inclusions: 30 to 40 percent
Contrasting inclusions: 0 to 15 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent material: Shale interbedded with fine grained sandstone, siltstone, and limestone
Shape of areas: Long and narrow to irregular
Size of areas: 3 to 75 acres

Typical Profile

Chiswell

0 to 2 inches—dark brown silt loam
2 to 11 inches—yellowish brown channery silt loam
11 to 14 inches—yellowish brown very channery silt loam
14 to 17 inches—yellowish brown extremely channery silt loam
17 to 20 inches—olive brown weathered shale
20 inches—shale

Litz

0 to 5 inches—brown channery loam
5 to 11 inches—yellowish brown channery loam
11 to 26 inches—dark yellowish brown very channery loam and strong brown very channery clay loam
26 inches—shale

Inclusions

Contrasting inclusions:
- Areas of Carbo soils near the edges of the map unit

• Areas of very shallow soils near rock outcrops
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep over bedrock
• Areas of soils, scattered throughout the map unit, that have fewer rock fragments

17B—Coursey loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Coursey soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Terrace treads and risers
Landscape position: Foot slopes
Parent material: Loamy alluvium
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 30 acres

Typical Profile

0 to 8 inches—very dark brown loam
8 to 13 inches—light yellowish brown loam
13 to 26 inches—brownish yellow sandy clay loam
26 to 40 inches—brownish yellow sandy clay loam that has light brownish gray iron depletions and strong brown iron masses
40 to 53 inches—yellowish brown sandy clay loam that has light brownish gray iron depletions and strong brown iron masses
53 to 60 inches—yellowish brown and brown sandy clay loam that has light brownish gray iron depletions and strong brown iron masses
60 to 65 inches—light brownish gray sandy clay loam that has yellowish brown and strong brown iron masses

Inclusions

Contrasting inclusions:
• Areas of Pope soils, which are well drained, are subject to flooding, and are in positions on the landscape lower than those of the Coursey soil
• Areas of Purdy soils, which are poorly drained and are in positions on the landscape slightly lower than those of the Coursey soil
• Areas of Grimsley soils, which are well drained, are on foot slopes, and have more rock fragments than in the Coursey soil
• Areas of soils that were disturbed or covered either by development or mining
Similar inclusions:
• Areas of Allegheny soils, which are well drained and are in positions on the landscape higher than those of the Coursey soil

18B—Craigsville very gravelly sandy loam, 0 to 5 percent slopes, frequently flooded

Composition (Informed judgment)

Craigsville soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains
Landscape position: Toe slopes
Parent material: Alluvium derived from shale, siltstone, and sandstone
Shape of areas: Long and winding
Size of areas: 5 to 100 acres

Typical Profile

0 to 7 inches—dark brown very gravelly sandy loam
7 to 23 inches—brown very cobbly sandy loam
23 to 35 inches—reddish brown extremely cobbly sandy loam
35 to 61 inches—reddish brown extremely stony loamy sand

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are colluvial, are not subject to flooding, have more clay in the subsoil than that in the Craigsville soil, and are on the higher parts of the landscape at the edge of the map unit
• Areas of moderately well drained soils in old channels and depressions
Similar inclusions:
• Areas of Pope soils, which have fewer gravel, cobbles, and stones than the Craigsville soil and are generally higher on the landscape than the Craigsville soil

19D—Drypond-Rock outcrop complex, 15 to 35 percent slopes, extremely stony

Composition (Subjective judgment)

Drypond soil and similar inclusions: 60 to 70 percent

Rock outcrops: 20 to 30 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Mountains
Landscape position: Summits, shoulders, and upper parts of back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 100 acres

Typical Profile

Drypond

0 to 3 inches—brown very gravelly sandy loam
3 to 11 inches—yellowish brown very gravelly sandy loam
11 to 16 inches—yellowish brown extremely gravelly sandy loam
16 inches—hard quartzite

Rock outcrop

Hard quartzite

Inclusions

Contrasting inclusions:
• Areas of Calvin soils, which formed in shale, have more silt and less sand than the Drypond soil, have redder colors, and are deeper to bedrock than the Drypond soil, and are in the lower landscape positions
• Areas of Brushy soils, which formed in chert, are deeper to bedrock, and are in the lower positions of the map unit
• Areas of Lily soils, which formed in sandstone, are deeper to bedrock than the Drypond soil, and are in the lower landscape positions of the map unit
Similar inclusions:
• Areas of Wallen soils, which are scattered throughout the map unit and are deeper to bedrock than the Drypond soil
• Areas of rubbly and bouldery soils scattered throughout the map unit

19E—Drypond-Rock outcrop complex, 35 to 80 percent slopes, extremely stony

Composition (Subjective judgment)

Drypond soil and similar inclusions: 60 to 70 percent
Rock outcrops: 20 to 30 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Mountains
Landscape position: Summits, shoulders, and the upper part of back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 20 acres

Typical Profile

Drypond

0 to 3 inches—brown very gravelly sandy loam
3 to 11 inches—yellowish brown very gravelly sandy loam
11 to 16 inches—yellowish brown extremely gravelly sandy loam
16 inches—hard quartzite

Rock outcrop

Hard quartzite

Inclusions

Contrasting inclusions:
• Areas of Calvin soils, which formed in shale, have more silt and less sand than the Drypond soil, are redder and deeper to bedrock than the Drypond soil, and are in the lower landscape positions
• Areas of Brushy soils, which formed in chert, are deeper to bedrock than the Drypond soil, and are in the lower landscape positions
• Areas of Lily soils, which formed in sandstone, are deeper to bedrock than the Drypond soil, and are in the lower landscape positions
Similar inclusions:
• Areas of Wallen soils, which are scattered throughout the map unit and are deeper to bedrock
• Areas of rubbly and bouldery soils scattered throughout the map unit

20B—Frederick silt loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills

Landscape position: Summits, shoulders, and back slopes
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 90 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of moderately well drained soils that have a fragipan, that have less clay in the subsoil than that in the Frederick soil, and that are on colluvial side slopes and foot slopes
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Frederick gravelly silt loam scattered throughout the map unit
• Areas of Murrill soils, which are well drained, have less clay in the upper part of the subsoil than that in the Frederick soil, and are on colluvial side slopes and foot slopes
• Areas of Timberville soils, which are well drained, formed in colluvium and alluvium, and are in the lowest areas of the map unit
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within a depth of 4 to 6 feet of the surface

20C—Frederick silt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and foot slopes (fig. 5)
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 50 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of moderately well drained soils that have a fragipan, that have less clay in the subsoil than that in the Frederick soil, and that are on colluvial side slopes and foot slopes
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Frederick gravelly silt loam
• Areas of Murrill soils, which are well drained, have less clay in the upper part of the subsoil than that in the Frederick soil, and are on colluvial side slopes and foot slopes
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

20D—Frederick silt loam, 15 to 25 percent slopes

Composition (Statistical method, random points)

Confidence interval: 80 percent
Frederick soil and similar inclusions: 88 to 99 percent
Contrasting inclusions: 1 to 12 percent

Setting

Landform: Hills

Figure 5.—Contour stripcropping on Frederick silt loam, 7 to 15 percent slopes.

Landscape position: Summits, shoulders, and foot slopes
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 100 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
- Areas of soils, near rock outcrops, that have bedrock within 20 inches of the surface
- Areas of rock outcrop scattered throughout the map unit

Similar inclusions:
- Areas of Frederick gravelly silt loam
- Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
- Areas of soils, scattered throughout the map unit, that have less clay in the subsoil than that in the Frederick soil
- Areas of soils, scattered throughout the map unit, that have bedrock within 48 to 72 inches of the surface
- Areas of soils, scattered throughout the map unit, that are yellower in the subsoil
- Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick

20E—Frederick silt loam, 25 to 35 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding

Size of areas: 5 to 50 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
- Areas of poorly drained soils in drainageways
- Areas of rock outcrops scattered throughout the map unit

Similar inclusions:
- Areas of Frederick gravelly silt loam scattered throughout the map unit
- Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
- Areas of soils, scattered throughout the map unit, that are yellower in the subsoil
- Areas of soils, scattered throughout the map unit, that have less clay in the subsoil
- Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
- Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

20F—Frederick silt loam, 35 to 60 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Hills
Landscape position: Shoulders and back slopes
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding
Size of areas: 5 to 50 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
- Areas of poorly drained soils in drainageways
- Areas of rock outcrops scattered throughout the map unit

Similar inclusions:
- Areas of Frederick gravelly silt loam scattered throughout the map unit
- Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
- Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
- Areas of soils, scattered throughout the map unit, that have less clay in the subsoil than that in the Frederick soil
- Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
- Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

21B—Frederick gravelly silt loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and foot slopes
Parent material: Dolomitic limestone interbedded with sandstone, shale, and chert
Shape of areas: Short to long and winding
Size of areas: 5 to 65 acres

Typical Profile

0 to 8 inches—dark yellowish brown gravelly silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
- Areas of moderately well drained soils, on colluvial side slopes and foot slopes, that have a fragipan and that have less clay in the subsoil than in the Frederick soil
- Areas of poorly drained soils in drainageways

• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Frederick silt loam scattered throughout the map unit
• Areas of Murrill soils, which are well drained, are on colluvial fans and foot slopes, and have less clay in the upper part of the subsoil than that in the Frederick soil
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium derived from limestone, sandstone, and shale
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

21C—Frederick gravelly silt loam, 7 to 15 percent slopes

Composition (Informed judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and foot slopes
Parent material: Dolomitic limestone interbedded with sandstone, shale, and chert
Shape of areas: Short to long and winding
Size of areas: 5 to 50 acres

Typical Profile

0 to 8 inches—dark yellowish brown gravelly silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of moderately well drained soils, on colluvial side slopes and foot slopes, that have a fragipan and that have less clay in the subsoil than that in the Frederick soil
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Frederick silt loam scattered throughout the map unit
• Areas of Murrill soils, which are well drained, are on colluvial fans and foot slopes, and have less clay in the upper part of the subsoil than that in the Frederick soil
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

21D—Frederick gravelly silt loam, 15 to 25 percent slopes

Composition (Statistical method, random points)

Confidence interval: 90 percent
Frederick soil and similar inclusions: 82 to 90 percent
Contrasting inclusions: 10 to 18 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, back slopes, and foot slopes
Parent material: Dolomitic limestone interbedded with sandstone, shale, and chert
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 100 acres

Typical Profile

0 to 8 inches—dark yellowish brown gravelly silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of Wallen soils, which are moderately deep, formed in residuum derived from sandstone, are more than 35 percent rock fragments, have more sand and less clay than those in the Frederick soil, and are in the higher positions on the landscape, on the south side of Buckhorn Mountain
• Areas of soils that are more than 35 percent chert fragments and that are scattered throughout the map

units in the valley between Buckhorn and Rich Mountains
• Areas of very stony soils on Whitley Ridge
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Frederick silt loam scattered throughout the map unit
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface
• Areas of soils, scattered throughout the map unit, that have less clay in the subsoil

21E—Frederick gravelly silt loam, 25 to 35 percent slopes

Composition (Statistical method, random points)

Confidence interval: 80 percent
Frederick soil and similar inclusions: 81 to 95 percent
Contrasting inclusions: 5 to 19 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent material: Dolomitic limestone interbedded with sandstone, shale, and chert
Shape of areas: Long and winding
Size of areas: 5 to 100 acres

Typical Profile

0 to 8 inches—dark yellowish brown gravelly silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of Carbo soils, which are moderately deep and are near rock outcrops
• Areas of Wallen soils, which are moderately deep, formed in residuum derived from sandstone, are more than 35 percent rock fragments, have more sand and less clay than the Frederick soil, and are in the higher positions on the landscape, on the south side of Buckhorn Mountain
• Areas of soils that are more than 35 percent chert fragments and that are scattered throughout the valley between Buckhorn and Rich Mountains
• Areas of very stony soils on Whitley Ridge
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Frederick silt loam scattered throughout the map unit
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick

21F—Frederick gravelly silt loam, 35 to 60 percent slopes

Composition (Informed judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills
Landscape position: Shoulders and back slopes
Parent material: Dolomitic limestone interbedded with sandstone, shale, and chert
Shape of areas: Long and winding
Size of areas: 5 to 50 acres

Typical Profile

0 to 8 inches—dark yellowish brown gravelly silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of Wallen soils, which are moderately deep, formed in residuum derived from sandstone, are more than 35 percent rock fragments, have more sand and less clay than the Frederick soil, and are in the higher positions on the landscape, on the south side of Buckhorn Mountain
• Areas of soils that are more than 35 percent chert

fragments and that are scattered throughout the map units in the valley between Buckhorn and Rich Mountains
• Areas of very stony soils on Whitley Ridge
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Frederick silt loam scattered throughout the map unit
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

22B—Frederick silt loam, karst, 2 to 7 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent
Karst: 2 to 5 sinkholes per 5 acres

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Narrow or irregular
Size of areas: 5 to 20 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of moderately well drained soils in the center of numerous sinkholes scattered throughout the map unit
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Murrill soils, which are well drained, are on colluvial side slopes and foot slopes, and have less clay in the subsoil than the Frederick soil
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

22C—Frederick silt loam, karst, 7 to 15 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent
Karst: 2 to 5 sinkholes per 5 acres

Setting

Landform: Hills
Landscape position: Summits, shoulders, and foot slopes
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 200 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of moderately well drained soils in the center of numerous sinkholes scattered throughout the map unit
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Murrill soils, which are well drained, are on colluvial side slopes and foot slopes, and have less clay in the subsoil than the Frederick soil
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium

• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface

22D—Frederick silt loam, karst, 15 to 25 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent
Karst: 2 to 5 sinkholes per 5 acres

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent Material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 225 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of moderately well drained soils in the center of numerous sinkholes scattered throughout the map unit
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Timberville soils, which are well drained, are in the lowest areas of the map unit, and formed in colluvium and alluvium
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface
• Areas of soils, scattered throughout the map unit, that have less clay in the subsoil than that in the Frederick soil

22E—Frederick silt loam, karst, 25 to 35 percent slopes

Composition (Subjective judgment)

Frederick soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent
Karst: 2 to 5 sinkholes per 5 acres

Setting

Landform: Hills
Landscape position: Summits, shoulders, back slopes and some foot slopes
Parent material: Dolomitic limestone interbedded with sandstone and shale
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 225 acres

Typical Profile

0 to 8 inches—dark yellowish brown silt loam
8 to 14 inches—strong brown silty clay loam
14 to 27 inches—yellowish red silty clay
27 to 50 inches—yellowish red clay
50 to 62 inches—yellowish red silty clay

Inclusions

Contrasting inclusions:
• Areas of moderately well drained soils in the center of numerous sinkholes scattered throughout the map unit
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that are yellower in the subsoil than the Frederick soil
• Areas of soils, scattered throughout the map unit, that have a surface layer and subsoil less than 60 inches thick
• Areas of soils, scattered throughout the map unit, that have bedrock within 4 to 6 feet of the surface
• Areas of soils, scattered throughout the map unit, that have less clay in the subsoil

23C—Gilpin-Berks complex, 7 to 15 percent slopes

Composition (Subjective judgment)

Gilpin soil and similar inclusions: 45 to 55 percent

Berks soil and similar inclusions: 30 to 40 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits and shoulders
Parent material: Noncalcareous shale
Shape of areas: Irregular, or very long and broad
Size of areas: 5 to 20 acres

Typical Profile

Gilpin

0 to 2 inches—dark brown silt loam
2 to 6 inches—yellowish brown silt loam
6 to 30 inches—strong brown silty clay loam
30 to 35 inches—yellowish brown very channery silt loam
35 inches—weathered shale

Berks

0 to 4 inches—dark brown channery silt loam
4 to 14 inches—dark yellowish brown channery silt loam
14 to 33 inches—strong brown very channery silt loam
33 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Cedarcreek soils, which are in mined areas and are very deep to bedrock
• Areas of Grimsley soils, which are deep and colluvial, are in drainageways and on the lower foot slopes, and have fragments of sandstone
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, which formed in residuum derived from sandstone and have more sand, less silt, and fewer rock fragments than the Berks soil
• Areas of Lily soils, which formed in residuum derived from sandstone and have more sand and less silt than the Gilpin soil
• Areas of soils that are 40 to 60 inches deep to bedrock and that are scattered throughout the map unit, especially in saddles and on summits

23D—Gilpin-Berks complex, 15 to 25 percent slopes

Composition (Informed judgment)

Gilpin soil and similar inclusions: 45 to 55 percent
Berks soil and similar inclusions: 30 to 40 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Noncalcareous shale
Shape of areas: Irregular, or very long and broad
Size of areas: 5 to 40 acres

Typical Profile

Gilpin

0 to 2 inches—dark brown silt loam
2 to 6 inches—yellowish brown silt loam
6 to 30 inches—strong brown silty clay loam
30 to 35 inches—yellowish brown very channery silt loam
35 inches—weathered shale

Berks

0 to 4 inches—dark brown channery silt loam
4 to 14 inches—dark yellowish brown channery silt loam
14 to 33 inches—strong brown very channery silt loam
33 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Cedarcreek soils, which are in mined areas and are very deep to bedrock
• Areas of Grimsley soils, which are deep and colluvial, are in drainageways, are on the lower foot slopes, and have sandstone fragments
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, which formed in residuum derived from sandstone and have more sand, less silt, and fewer rock fragments than the Berks soil
• Areas of Lily soils, which formed in residuum derived from sandstone and have more sand and less silt than the Gilpin soil
• Areas of soils that are 40 to 60 inches deep to bedrock and that are scattered throughout the map unit, especially in saddles and on summits

24C—Grimsley loam, 8 to 15 percent slopes, very stony

Composition (Subjective judgment)

Grimsley soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Foot slopes
Parent material: Colluvium derived from sandstone and shale
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 25 acres

Typical Profile

0 to 2 inches—dark grayish brown very channery loam
2 to 10 inches—yellowish brown channery loam
10 to 60 inches—yellowish brown very channery clay loam

Inclusions

Contrasting inclusions:
• Areas of Alticrest soils, which are moderately deep, are in the higher positions on the landscape, formed in residuum derived from sandstone, and have fewer rock fragments than the Grimsley soil
• Areas of Cedarcreek soils, which are in disturbed areas, formed in mine spoil, and do not have genetic horizons
• Areas of Gilpin soils, which are moderately deep, are on nose slopes and shoulders, formed in residuum derived from shale, and have fewer rock fragments than the Grimsley soil
• Areas of Lily soils, which are moderately deep, formed in residuum derived from sandstone, have fewer rock fragments than the Grimsley soil, and are in the higher landscape positions
• Areas of Philo soils on narrow flood plains
• Areas of moderately well drained soils, in drainageways, that are similar to the Grimsley soil
Similar inclusions:
• Areas of Berks soils, which are moderately deep, are on nose slopes and shoulders, and formed in residuum derived from shale
• Areas of Grimsley loam, very stony, scattered throughout the map unit
• Areas of Grimsley sandy loam, very stony, scattered throughout the map unit
• Areas of soils that are more than 60 inches deep to bedrock and that are generally in the lower positions on the landscape
• Areas of deep, colluvial soils, scattered throughout the map unit, that have fewer rock fragments than the Grimsley soil
• Areas of nonstony Grimsley soils

24D—Grimsley loam, 15 to 35 percent slopes, very stony

Composition (Informed judgment)

Grimsley soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Back slopes and foot slopes
Parent material: Colluvium derived from sandstone and shale
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 100 acres

Typical Profile

0 to 2 inches—dark grayish brown very channery loam
2 to 10 inches—yellowish brown channery loam
10 to 60 inches—yellowish brown very channery clay loam

Inclusions

Contrasting inclusions:
• Areas of Alticrest soils, which are moderately deep, formed in residuum derived from sandstone, have fewer rock fragments than the Grimsley soil, and are in the higher landscape positions
• Areas of Cedarcreek soils, which are in disturbed areas, formed in mine spoil, and do not have natural horizons
• Areas of Gilpin soils, which are moderately deep, are on nose slopes and shoulders, formed in residuum derived from shale, and have fewer rock fragments than the Grimsley soil
• Areas of Lily soils, which are moderately deep, formed in residuum derived from sandstone, have fewer rock fragments than the Grimsley soil, and are in the higher landscape positions
• Areas of Philo soils on narrow flood plains
• Areas of moderately well drained soils, in drainageways, that are similar to the Grimsley soil
Similar inclusions:
• Areas of Berks soils, which are moderately deep, formed in residuum derived from shale, and are on nose slopes and shoulders
• Areas of Grimsley loam, very stony, scattered throughout the map unit
• Areas of Grimsley sandy loam, very stony, scattered throughout the map unit
• Areas of soils, generally in the lower landscape positions, that are more than 60 inches deep over bedrock
• Areas of deep, colluvial soils that have fewer rock

fragments than the Grimsley soil and that are scattered throughout the map unit
• Areas of nonstony Grimsley soils

24E—Grimsley loam, 35 to 70 percent slopes, very stony

Composition (Statistical method, random points)

Confidence interval: 90 percent
Grimsley soil and similar inclusions: 75 to 88 percent
Contrasting inclusions: 12 to 25 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Foot slopes and back slopes
Parent material: Colluvium derived from sandstone and shale
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 500 acres

Typical Profile

0 to 2 inches—dark grayish brown very channery loam
2 to 10 inches—yellowish brown channery loam
10 to 60 inches—yellowish brown very channery clay loam

Inclusions

Contrasting inclusions:
• Areas of Alticrest soils, which are moderately deep, formed in residuum derived from sandstone, have fewer rock fragments, and are in the higher landscape positions
• Areas of Cedarcreek soils, which formed in mine spoil in disturbed areas and do not have horizons that occurred naturally
• Areas of Gilpin soils, which are moderately deep, formed in residuum derived from shale, have fewer rock fragments, and are on nose slopes and shoulders
• Areas of Lily soils, which are moderately deep, are in the higher landscape positions, formed in residuum derived from sandstone, and have fewer rock fragments than the Grimsley soil
• Areas of Philo soils on narrow flood plains
• Areas of moderately well drained soils, in drainageways, that are similar to the Grimsley soil
• Areas of sandy soils in the upper landscape positions
Similar inclusions:
• Areas of Berks soils, which are moderately deep, are on nose slopes and shoulders, and formed in residuum derived from shale
• Areas of Grimsley loam, very stony, scattered throughout the map unit
• Areas of Grimsley sandy loam, very stony, scattered throughout the map unit
• Areas of soils, generally in the lower landscape positions, that are more than 60 inches deep over bedrock
• Areas of deep, colluvial soils, scattered throughout the map unit, that have fewer rock fragments than the Grimsley soil
• Areas of nonstony Grimsley soils

25D—Grimsley-Cedarcreek-Berks complex, 8 to 35 percent slopes, very rocky

Composition (Subjective judgment)

Grimsley soil and similar inclusions: 35 to 40 percent
Cedarcreek soil and similar inclusions: 25 to 30 percent
Berks soil and similar inclusions: 20 to 25 percent
Rock outcrop: 2 to 10 percent
Contrasting inclusions: 5 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Shoulders, back slopes, and foot slopes (fig. 6)
Parent material: Colluvium, mine spoil, and residual shale
Shape of areas: Irregular, or very long and broad
Size of areas: 10 to 50 acres

Typical Profile

Grimsley

0 to 2 inches—dark grayish brown very channery loam
2 to 10 inches—yellowish brown channery loam
10 to 60 inches—yellowish brown very channery clay loam

Cedarcreek

0 to 4 inches—very dark grayish brown extremely stony loam
4 to 26 inches—dark grayish brown and dark yellowish brown extremely stony loam
26 to 58 inches—yellowish brown extremely stony loam
58 to 72 inches—dark grayish brown very gravelly loam

Berks

0 to 4 inches—dark brown channery silt loam

Figure 6.—Reclaimed mine land in an area of Grimsley-Cedarcreek-Berks complex, 8 to 35 percent slopes, very rocky.

4 to 14 inches—dark yellowish brown channery silt loam
14 to 33 inches—strong brown very channery silt loam
24 to 33 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Lily soils, which are moderately deep, formed in residuum derived from sandstone, and have fewer rock fragments than the Cedarcreek, Grimsley, and Berks soils
• Areas of moderately well drained soils in drainageways
Similar inclusions:
• Areas of Alticrest soils, which formed in residuum derived from sandstone and have more sand and fewer rock fragments than the Berks soil
• Areas of Gilpin soils, which formed in residuum derived from shale and have fewer rock fragments than those in the Berks soil

25E—Grimsley-Cedarcreek-Berks complex, 35 to 70 percent slopes, rocky

Composition (Informed judgment)

Grimsley soil and similar inclusions: 35 to 40 percent
Cedarcreek soil and similar inclusions: 30 to 35 percent
Berks soil and similar inclusions: 20 to 25 percent
Rock outcrop: 1 to 2 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges and spurs
Landscape position: Shoulder, back slopes, and foot slopes
Parent material: Mine spoil, colluvium, and residual shale
Shape of areas: Irregular, or very long and broad
Size of areas: 10 to 500 acres

Typical Profile

Grimsley

0 to 2 inches—dark grayish brown very channery loam
2 to 10 inches—yellowish brown channery loam
10 to 60 inches—yellowish brown very channery clay loam

Cedarcreek

0 to 4 inches—very dark grayish brown extremely stony loam
4 to 26 inches—dark grayish brown and dark yellowish brown extremely stony loam
26 to 58 inches—yellowish brown extremely stony loam
58 to 72 inches—dark grayish brown very gravelly loam

Berks

0 to 4 inches—dark brown channery silt loam
4 to 14 inches—dark yellowish brown channery silt loam
14 to 33 inches—strong brown very channery silt loam
33 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Lily soils, which are moderately deep, formed in residuum derived from sandstone, and have fewer rock fragments than the Cedarcreek, Grimsley, and Berks soils
• Areas of moderately well drained soils in drainageways
Similar inclusions:
• Areas of Alticrest soils, which formed in residuum derived from sandstone and have more sand and fewer rock fragments than the Berks soil
• Areas of Gilpin soils, which formed in residuum derived from shale and have fewer rock fragments than the Berks soils

26B—Groseclose silt loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Groseclose soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent material: Limestone interbedded with shale, siltstone, and sandstone
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 90 acres

Typical Profile

0 to 5 inches—dark yellowish brown silt loam
5 to 11 inches—brown silty clay loam
11 to 52 inches—yellowish red clay
52 to 61 inches—yellowish red silty clay loam

Inclusions

Contrasting inclusions:
• Areas of Guernsey soils, which are moderately well drained and are in the most gently sloping areas of the map unit
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of very deep soils, scattered throughout the map unit, that have a surface layer and subsoil more than 60 inches thick
• Areas of deep, clayey soils scattered throughout the map unit

26C—Groseclose silt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Groseclose soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and foot slopes
Parent material: Limestone interbedded with shale, siltstone, and sandstone
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 50 acres

Typical Profile

0 to 5 inches—dark yellowish brown silt loam
5 to 11 inches—brown silty clay loam
11 to 52 inches—yellowish red clay
52 to 61 inches—yellowish red silty clay loam

Inclusions

Contrasting inclusions:
• Areas of moderately well drained Guernsey soils in the most gently sloping areas of the map unit
• Areas of Gilpin soils in the higher landscape positions

• Areas of rock outcrop scattered throughout the map unit
Similar inclusions:
• Areas of very deep soils, scattered throughout the map unit, that have a surface layer and subsoil more than 60 inches thick
• Areas of deep, clayey soils scattered throughout the map unit
• Areas of deep, fine-loamy soils scattered throughout the map unit

26D—Groseclose silt loam, 15 to 25 percent slopes

Composition (Subjective judgment)

Groseclose soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, back slopes, and foot slopes
Parent material: Limestone interbedded with shale, siltstone, and sandstone
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 60 acres

Typical Profile

0 to 5 inches—dark yellowish brown silt loam
5 to 11 inches—brown silty clay loam
11 to 52 inches—yellowish red clay
52 to 61 inches—yellowish red silty clay loam

Inclusions

Contrasting inclusions:
• Areas of Gilpin soils, which are moderately deep, are in the higher landscape positions, and have less clay than the Groseclose soil
• Areas of Litz soils, which are moderately deep, are in the higher landscape positions, and have less clay and more rock fragments than the Groseclose soil
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of very deep soils, scattered throughout the map unit, that have a surface layer and subsoil more than 60 inches thick
• Areas of very deep soils, scattered throughout the map unit, that have a thinner solum than the Groseclose soil
• Areas of deep, fine-loamy soils scattered throughout the map unit

26E—Groseclose silt loam, 25 to 35 percent slopes

Composition (Subjective judgment)

Groseclose soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills
Landscape position: Summits, shoulders, and back slopes
Parent material: Limestone interbedded with shale, siltstone, and sandstone
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 50 acres

Typical Profile

0 to 5 inches—dark yellowish brown silt loam
5 to 11 inches—brown silty clay loam
11 to 52 inches—yellowish red clay
52 to 61 inches—yellowish red silty clay loam

Inclusions

Contrasting inclusions:
• Areas of Carbo soils, which are moderately deep and are near rock outcrops
• Areas of Gilpin soils, which are moderately deep, are in the higher landscape positions, and have less clay than the Groseclose soil
• Areas of Litz soils, which are moderately deep, are in the higher landscape positions, and have less clay and more rock fragments than the Groseclose soil
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of very deep soils, scattered throughout the map unit, that have a surface layer and subsoil more than 60 inches thick
• Areas of very deep soils, scattered throughout the map unit, that have a thinner solum than the Groseclose soil
• Areas of deep soils, scattered throughout the map unit, that have less clay than the Groseclose soil

27B—Guernsey silt loam, 2 to 7 percent slopes

Composition (Informed judgment)

Guernsey soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills
Landscape position: Foot slopes and toe slopes
Parent material: Residuum and colluvium derived from sandstone, siltstone, shale, and limestone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 50 acres

Typical Profile

0 to 10 inches—dark brown silt loam
10 to 21 inches—yellowish brown silty clay loam
21 to 44 inches—strong brown silty clay loam that has light gray iron depletions
44 to 56 inches—strong brown silty clay loam that has yellowish brown, soft iron masses
56 to 61 inches—light gray silty clay that has strong brown, soft iron masses

Inclusions

Contrasting inclusions:
• Areas of Allegheny soils, which are well drained, have less clay than the Guernsey soil, and are in landscape positions similar to or higher than those of the Guernsey soil
• Areas of moderately deep, moderately well drained soils, on the higher parts of the landscape, that formed in residuum derived from shale
Similar inclusions:
• Areas of Coursey soils, which have less clay than the Guernsey soil and are on landscapes similar to those of the Guernsey soil
• Areas of Guernsey soils on 0 to 2 percent slopes in landscape positions similar to or lower than those of this Guernsey soil
• Areas of somewhat poorly drained soils in landscape positions similar to or slightly lower than those of the Guernsey soil

27C—Guernsey silt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Guernsey soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills
Landscape position: Foot slopes
Parent material: Residuum and colluvium derived from sandstone, siltstone, shale, and limestone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 50 acres

Typical Profile

0 to 10 inches—brown silt loam
10 to 21 inches—yellowish brown silty clay loam
21 to 44 inches—strong brown silty clay loam that has light gray iron depletions
44 to 56 inches—strong brown silty clay loam that has yellowish brown, soft iron masses
56 to 61 inches—light gray silty clay that has strong brown, soft iron masses

Inclusions

Contrasting inclusions:
• Areas of well drained Allegheny soils that have less clay than that in the Guernsey soil and that are in landscape positions similar to or higher than those of the Guernsey soil
• Areas of moderately deep, moderately well drained soils that formed in residuum derived from shale and that are on the higher parts of the landscape
Similar inclusions:
• Areas of somewhat poorly drained soils in landscape positions similar to or slightly lower than the Guernsey soil
• Areas of Coursey soils that have less clay than that in the Guernsey soil and that are in landscape positions similar to those of the Guernsey soil

28C—Lily fine sandy loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Lily soil and similar inclusions: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits and shoulders
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 30 acres

Typical Profile

0 to 4 inches—dark brown fine sandy loam
4 to 30 inches—yellowish brown clay loam
30 to 36 inches—yellowish brown gravelly sandy loam
36 inches—weathered sandstone

Inclusions

Contrasting inclusions:
• Areas of Berks soils that formed in residuum derived from shale, that have more shale fragments than those

in the Lily soil, and that are in landscape positions similar to those of the Lily soil
• Areas of deep, colluvial Grimsley soils in drainageways
• Areas of Wallen soils that have more rock fragments than those in the Lily soil and that are scattered throughout the map unit, mainly on nose slopes and summits
• Areas of soils, scattered throughout the map unit, that formed in residuum derived from shale and that are less than 20 inches deep over bedrock
• Areas of soils, scattered throughout the map unit, that formed in residuum derived from shale and that are more than 40 inches deep to bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, scattered throughout the map unit, that have more sand and less clay than those in the Lily soil
• Areas of Gilpin soils that formed in residuum derived from shale, that have more silt and less sand than those in the Lily soil, and that are in landscape positions similar to those of the Lily soil

28D—Lily fine sandy loam, 15 to 25 percent slopes

Composition (Informed judgment)

Lily soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 50 acres

Typical Profile

0 to 4 inches—dark brown fine sandy loam
4 to 30 inches—yellowish brown clay loam
30 to 36 inches—yellowish brown gravelly sandy loam
36 inches—weathered sandstone

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which formed in residuum derived from shale, have more shale fragments than the Lily soil, and are in landscape positions similar to those of the Lily soil
• Areas of Grimsley soils, which are deep and colluvial and in drainageways
• Areas of Wallen soils that have more rock fragments than those in the Lily soil and that are scattered throughout the map unit, especially on nose slopes and summits
• Areas of soils, scattered throughout the map unit, that formed in residuum derived from shale and that are less than 20 inches deep over bedrock
• Areas of colluvial soils, on foot slopes, that are more than 40 inches deep over bedrock and that have a fragipan
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, which are scattered throughout the map unit and have more sand and less clay than the Lily soil
• Areas of Gilpin soils, which formed in residuum derived from shale, have more silt and less sand than the Lily soil, and are in landscape positions similar to those of the Lily soil

28E—Lily fine sandy loam, 25 to 35 percent slopes

Composition (Statistical method, random points)

Confidence interval: 80 percent
Lily soil and similar inclusions: 90 to 99 percent
Contrasting inclusions: 1 to 10 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 100 acres

Typical Profile

0 to 4 inches—dark brown fine sandy loam
4 to 30 inches—yellowish brown clay loam
30 to 36 inches— yellowish brown gravelly sandy loam
36 inches—weathered sandstone

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which formed in residuum derived from shale, have more shale fragments than the Lily soil, and are in landscape positions similar to those of the Lily soil

• Areas of Grimsley soils, which are deep and colluvial and are in drainageways
• Areas of Wallen soils, which have more rock fragments than the Lily soil and are scattered throughout the map unit, especially on nose slopes and summits
• Areas of soils, scattered throughout the map unit, that formed in residuum derived from shale and that are less than 20 inches deep to bedrock
• Areas of moderately well drained soils on benches and foot slopes
• Areas of soils, scattered throughout the map unit, that formed in residuum derived from shale and that are more than 40 inches deep to bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, which are scattered throughout the map unit and have more sand and less clay than the Lily soil
• Areas of Gilpin soils, which formed in residuum derived from shale, have more silt and less sand than the Lily soil, and are in landscape positions similar to those of the Lily soil

28F—Lily fine sandy loam, 35 to 65 percent slopes

Composition (Statistical method, random points)

Confidence interval: 90 percent
Lily soil and similar inclusions: 78 to 91 percent
Contrasting inclusions: 9 to 22 percent

Setting

Landform: Ridges and spurs
Landscape position: Shoulders and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 150 acres

Typical Profile

0 to 4 inches—dark brown fine sandy loam
4 to 30 inches—yellowish brown clay loam
30 to 36 inches—yellowish brown gravelly sandy loam
36 inches—weathered sandstone

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which formed in residuum derived from shale, have more shale fragments than the Lily soil, and are in landscape positions similar to those of the Lily soil
• Areas of Grimsley soils, which are deep and colluvial and are in drainageways
• Areas of Wallen soils, which have more rock fragments than the Lily soil and are scattered throughout the map unit, especially on nose slopes and summits
• Areas of soils, scattered throughout the map unit, that formed in residuum derived from shale and that are less than 20 inches deep to bedrock
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Alticrest soils, which are scattered throughout the map unit and have more sand and less clay
• Areas of Gilpin soils, which formed in residuum derived from shale, have more silt and less sand than the Lily soil, and are in landscape positions similar to those of the Lily soil

29D—Lily fine sandy loam, 15 to 35 percent slopes, very stony

Composition (Subjective judgment)

Lily soil and similar inclusions: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 100 acres

Typical Profile

0 to 6 inches—yellowish brown loam
6 to 24 inches—strong brown clay loam
24 to 26 inches—strong brown gravelly clay loam
26 inches—sandstone

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which are in the lower landscape positions, formed in residuum derived from shale, and have shale fragments
• Areas of Brushy soils, which formed in cherty limestone, have more chert fragments than the Lily soil, and are in the lower landscape positions
• Areas of Murrill soils, which are very deep and colluvial and are in the lower landscape positions
• Areas of Oriskany soils, which are very deep and

colluvial, are in drainageways, and have more rock fragments than the Lily soil
Similar inclusions:
• Areas of deep soils, scattered throughout the map unit, that formed in residuum derived from sandstone

29E—Lily fine sandy loam, 35 to 55 percent slopes, very stony

Composition (Subjective judgment)

Lily soil and similar inclusions: 80 to 85 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 100 acres

Typical Profile

0 to 6 inches—yellowish brown loam
6 to 24 inches—strong brown clay loam
24 to 26 inches—strong brown gravelly clay loam
26 inches—sandstone

Inclusions

Contrasting inclusions:
• Areas of Alticrest soils, which are scattered throughout the map unit and have more sand and less clay than the Lily soil
• Areas of Berks soils, which are in the lower landscape positions, formed in residuum derived from shale, and have more shale fragments than the Lily soil
• Areas of Brushy soils, which are in the lower landscape positions, formed in cherty limestone, and have more chert fragments than the Lily soil
• Areas of Murrill soils, which are colluvial and very deep and are in the lower landscape positions
• Areas of Oriskany soils, which are colluvial and very deep in drainageways and have more rock fragments than the Lily soil
• Areas of Weikert soils, which are shallow, are in the lower landscape positions, formed in residuum derived from shale, and have more shale fragments than the Lily soil
Similar inclusions:
• Areas of deep soils, scattered throughout the map unit, that formed in residuum derived from sandstone

30C—Madsheep channery silt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Madsheep soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Mountains
Landscape position: Summits and shoulders
Parent material: Acid, red shale
Shape of areas: Irregular, or long and broad
Size of areas: 5 to 10 acres

Typical Profile

3 inches to 0—partly decomposed and undecomposed, loose leaves and twigs
0 to 5 inches—dark brown channery silt loam
5 to 22 inches—yellowish red very channery silt loam
22 to 25 inches—reddish brown extremely channery silt loam
25 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Paddyknob soils, which are in the higher landscape positions, formed in residuum derived from sandstone, have more sand and less silt than the Lily soil, and are yellower than the Lily soil
• Areas of rock outcrops in the higher landscape positions
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

30D—Madsheep channery silt loam, 15 to 35 percent slopes

Composition (Subjective judgment)

Madsheep soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Mountains
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid, red shale

Shape of areas: Irregular, or long and broad
Size of areas: 10 to 50 acres

Typical Profile

3 inches to 0—partly decomposed and undecomposed loose leaves and twigs
0 to 5 inches—dark brown channery silt loam
5 to 22 inches—yellowish red very channery silt loam
22 to 25 inches—reddish brown extremely channery silt loam
25 inches—weathered shale

Inclusions

Contrasting inclusions:
• Areas of Paddyknob soils, which are in the higher landscape positions, formed in residuum derived from sandstone, have more sand and less silt than the Madsheep soil, and are yellower than the Madsheep soil
• Areas of rock outcrops in the higher landscape positions
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

31E—Madsheep channery silt loam, 35 to 55 percent slopes, very stony

Composition (Subjective judgment)

Madsheep soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Mountains
Landscape position: Summits, shoulders, and back slopes
Parent material: Acid, red shale
Shape of areas: Irregular, or long and broad
Size of areas: 10 to 50 acres

Typical Profile

2 inches to 0—loose leaves and twigs
0 to 1 inch—very dark brown organic material
1 to 7 inches—dark brown very stony silt loam
7 to 24 inches—reddish brown very channery silt loam
24 to 27 inches—dark reddish brown extremely channery loam
27 inches—hard shale

Inclusions

Contrasting inclusions:
• Areas of Paddyknob soils, which are in the upper landscape positions, formed in residuum derived from sandstone, have more sand and less silt than the Madsheep soil, and are yellower than the Madsheep soil
• Areas of rock outcrops that are scattered throughout the map unit, but are mostly on nose slopes and in the upper landscape positions
Similar inclusions:
• Areas of Madsheep channery silt loam, scattered throughout the map unit, but mostly in the lower landscape positions
• Areas of soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

32A—Melvin silt loam, 0 to 2 percent slopes, frequently flooded

Composition (Informed judgment)

Melvin soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains
Landscape position: Toe slopes (fig. 7)
Parent material: Alluvium derived from limestone, shale, and sandstone
Shape of areas: Long and winding
Size of areas: 5 to 100 acres

Typical Profile

0 to 3 inches—dark yellowish brown silt loam
3 to 10 inches—light brownish gray silt loam
10 to 30 inches—dark gray and dark grayish brown silt loam
30 to 50 inches—very dark gray silt loam
50 to 62 inches—dark gray gravelly sandy loam

Inclusions

Contrasting inclusions:
• Areas of Lindside soils, which are moderately well drained and are in landscape positions similar to or slightly higher than those of the Melvin soil
• Areas of soils, scattered throughout the map unit, that have a thick, dark surface layer
• Areas of soils, scattered throughout the map unit, that have a gravelly or very gravelly solum

Figure 7.—Pasture on Melvin silt loam, 0 to 2 percent slopes, frequently flooded. Frederick silt loam, 25 to 35 percent slopes, is on the bank.

Similar inclusions:
- Areas of Newark soils, which are somewhat poorly drained and are in landscape positions similar to or slightly higher than those of the Melvin soil
- Areas of soils, scattered throughout the map unit, that are more than 35 percent clay in the subsoil
- Areas of soils, scattered throughout the map unit, that have more sand and less silt in the control section than the Melvin soil

33—Mine Tipples, Dumps, and Tailings

Composition (Subjective judgment)

Tipples: 5 to 10 percent
Dumps: 50 to 60 percent
Tailings: 30 to 40 percent

Setting

Landform: Variable
Landscape position: Variable
Parent material: Coal residue and associated sandstone and shale fragments
Shape of areas: Irregular
Size of areas: 5 to 25 acres

Typical Profile

Tipples

Areas of buildings and equipment for collecting coal from loaded cars or conveyor belts

Dumps

No profile described; waste piles of refuse from mining coal and associated shale and sandstone fragments

Tailings

Ponds of waste from mining coal and associated shale and sandstone fragments

Figure 8.—Cultivated field on Murrill silt loam, 2 to 7 percent slopes.

34B—Murrill silt loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Murrill soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

Setting

Landform: Ridges and spurs
Landscape position: Foot slopes (fig. 8 and fig. 9)
Parent material: Colluvium derived from sandstone and shale
Shape of areas: Long and narrow, or broad and irregular
Size of areas: 5 to 50 acres

Typical Profile

0 to 10 inches—dark brown silt loam
10 to 22 inches—strong brown silt loam
22 to 44 inches—strong brown clay loam
44 to 56 inches—yellowish red and strong brown gravelly clay
56 to 61 inches—strong brown gravelly clay

Inclusions

Contrasting inclusions:
- Areas of moderately deep soils near the edges of map units

Similar inclusions:
- Areas of Timberville soils in drainageways
- Areas of clayey, colluvial soils scattered throughout the map unit

34C—Murrill silt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Soils and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

Setting

Landform: Ridges and spurs
Landscape position: Foot slopes (fig. 10)
Parent material: Colluvium derived from sandstone and shale
Shape of areas: Long and narrow, or broad and irregular

Size of areas: 5 to 110 acres

Typical Profile

0 to 10 inches—dark brown silt loam
10 to 22 inches—strong brown silt loam
22 to 44 inches—strong brown clay loam
44 to 56 inches—yellowish red and strong brown gravelly clay
56 to 61 inches—strong brown gravelly clay

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which have a gravelly or cobbly surface layer, are on landscapes similar to those of the Murrill soil, and are in higher, colluvial areas
• Areas of moderately deep soils near the edges of map units
Similar inclusions:
• Areas of clayey, colluvial soils scattered throughout the map unit

34D—Murrill silt loam, 15 to 25 percent slopes

Composition (Subjective judgment)

Murrill soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges and spurs
Landscape position: Foot slopes
Parent material: Colluvium derived from sandstone and shale
Shape of areas: Long and narrow, or broad and irregular
Size of areas: 5 to 40 acres

Typical Profile

0 to 10 inches—dark brown silt loam
10 to 22 inches—strong brown silt loam
22 to 44 inches—strong brown clay loam
44 to 56 inches—yellowish red and strong brown gravelly clay

Figure 9.—Stripcropping on Murrill silt loam, 2 to 7 percent slopes.

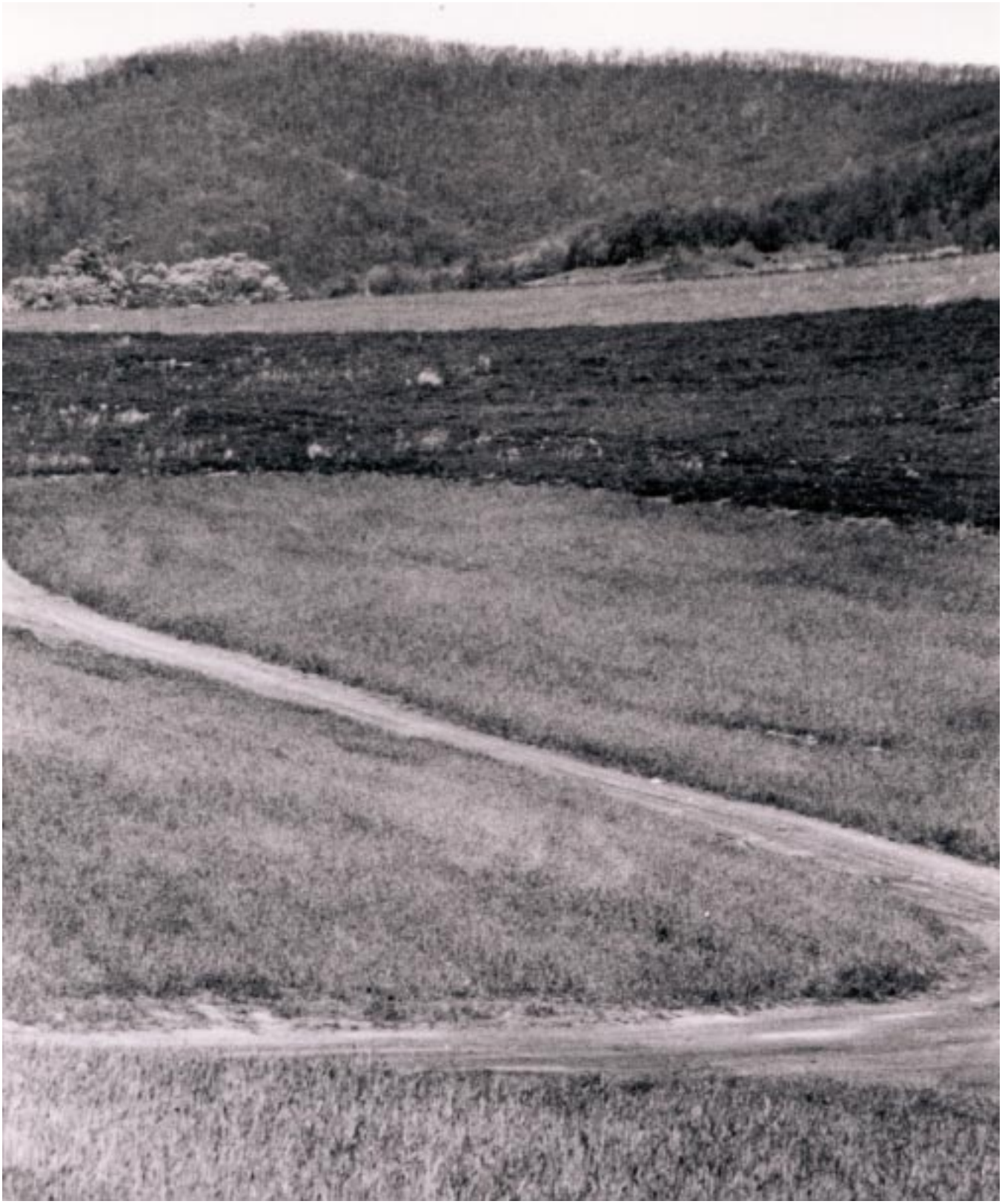

Figure 10.—In the foreground, a contoured hayfield on Murrill silt loam, 7 to 15 percent slopes. Frederick gravelly silt loam, 7 to 15 percent slopes, and Frederick gravelly silt loam, 15 to 25 percent slopes, are on the hilltop.

56 to 61 inches—strong brown gravelly clay

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which have a loamy-skeletal control section, are on landscapes similar to those of the Murrill soil, and are in higher, colluvial areas
Similar inclusions:
• Areas of clayey, colluvial soils that are scattered throughout the map unit

35A—Newark-Lindside complex, 0 to 3 percent slopes, occasionally flooded

Composition (Informed judgment)

Newark soil and similar inclusions: 40 to 45 percent
Lindside soil and similar components: 40 to 45 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains
Landscape position: Toe slopes
Parent material: Alluvium derived from limestone-influenced soils on uplands
Shape of areas: Long and narrow, or irregular
Size of areas: 3 to 125 acres

Typical Profile

Newark

0 to 5 inches—dark brown silt loam
5 to 19 inches—brown and grayish brown silt loam that has strong brown, soft iron masses
19 to 30 inches—grayish brown silty clay loam that has brown, soft iron masses
30 to 45 inches—gray silty clay loam that has yellowish brown and dark yellowish brown soft, iron masses
45 to 61 inches—dark gray silty clay loam that has yellowish brown and strong brown, soft iron masses

Lindside

0 to 9 inches—brown silt loam
9 to 20 inches—brown silty clay loam
20 to 34 inches—grayish brown silty clay loam that has dark yellowish brown, soft iron masses
34 to 51 inches—grayish brown silty clay loam that has dark yellowish brown iron masses
51 to 61 inches—dark gray silty clay loam that has light gray and greenish gray iron depletions

Inclusions

Contrasting inclusions:
• Areas of Guernsey soils, which are on foot slopes and have more clay and less sand than the Newark and Lindside soils
• Areas of Philo soils, which are subject to frequent flooding and have more sand and less clay than the Newark and Lindside soils
• Areas of Timberville soils, which have more clay than the Newark and Lindside soils and are in landscape positions higher than those of the Newark and Lindside soils
• Areas of poorly drained soils that have more sand and less silt than the Newark and Lindside soils, that are in landscape positions similar to or lower than those of the Newark and Lindside soils, and that are subject to frequent flooding
• Areas of well drained soils that have more sand and less silt than the Newark and Lindside soils and that are in landscape positions similar to or higher than those of the Newark and Lindside soils
• Areas of poorly drained soils that have a thick, dark surface layer, that are subject to frequent flooding, and that are in landscape positions similar to or lower than those of the Newark and Lindside soils
• Areas of poorly drained and somewhat poorly drained soils that have more clay than the Newark and Lindside soils and that are in landscape positions higher than those of the Newark and Lindside soils
• Areas of soils that formed in limestone residuum, that have more clay than the Newark and Lindside soils, and that are in landscape positions higher than those of the Newark and Lindside soils
Similar inclusions:
• Areas of Melvin soils, which are poorly drained, are subject to frequent flooding, and are in slight depressions and in landscape positions similar to those of the Newark and Lindside soils
• Areas of soils that have more sand and less silt than the Newark and Lindside soils and that are in landscape positions similar to those of the Newark and Lindside soils
• Areas of soils that have more clay in the subsoil than the Newark and Lindside soils and that are in landscape positions similar to those of the Newark and Lindside soils

36F—Newbern-Rock outcrop complex, 25 to 70 percent slopes

Composition (Informed judgment)

Newbern soil and similar inclusions: 60 to 70 percent

Rock outcrops: 25 to 35 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Hills
Landscape position: Escarpments, generally along streams
Parent material: Limestone interbedded with shale
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 50 acres

Typical Profile

0 to 5 inches—dark yellowish brown silt loam
5 to 14 inches—dark yellowish brown silt loam
14 inches—limestone

Inclusions

Dissimilar inclusions:
• Areas of Carbo soils, which are moderately deep, are generally near the edges of map units, and have more clay than the Newbern soil
• Areas of soils, generally near the edges of map units, that are less than 20 inches deep over bedrock and that have more clay than the Newbern soil
Similar inclusions:
• Areas of Newbern loam scattered throughout the map unit
• Areas of Newbern channery or gravelly silt loam scattered throughout the map unit
• Areas of soils, scattered throughout the map unit, that are silty clay loam in the subsoil

37C—Oriskany gravelly fine sandy loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Oriskany soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Foot slopes
Parent material: Colluvium derived from acid sandstone and shale
Shape of areas: Irregular
Size of areas: 5 to 75 acres

Typical Profile

0 to 6 inches—dark brown gravelly fine sandy loam
6 to 14 inches—yellowish brown very cobbly fine sandy loam
14 to 61 inches—strong brown extremely stony sandy clay loam

Inclusions

Contrasting inclusions:
• Areas of Craigsville soils, which are on flood plains along small streams, are subject to frequent flooding, and have less clay than the Oriskany soil
Similar inclusions:
• Areas of Murrill soils, which are scattered throughout the map unit, have fewer rock fragments throughout, and have more clay in the subsoil than the Oriskany soil
• Areas of Oriskany soils on 2 to 7 percent slopes
• Areas of soils, scattered throughout the map unit, that have more clay throughout than the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have more silt throughout than the Oriskany soil

37D—Oriskany gravelly fine sandy loam, 15 to 25 percent slopes

Composition (Subjective judgment)

Oriskany soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Foot slopes
Parent material: Colluvium derived from acid sandstone and shale
Shape of areas: Irregular
Size of areas: 5 to 50 acres

Typical Profile

0 to 6 inches—dark brown gravelly fine sandy loam
6 to 14 inches—yellowish brown very cobbly fine sandy loam
14 to 60 inches—strong brown extremely stony sandy clay loam

Inclusions

Contrasting inclusions:
• Areas of Craigsville soils, which are on flood plains along small streams, are subject to frequent flooding, and have less clay than the Oriskany soil
Similar inclusions:
• Areas of Murrill soils, scattered throughout the map unit, that have fewer rock fragments throughout and that have more clay in the subsoil than the Oriskany soil
• Areas of soils, scattered throughout the map unit,

Figure 11.—Pasture on Oriskany gravelly fine sandy loam, 7 to 15 percent slopes, very stony.

that have more clay throughout the profile than the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have more silt throughout the profile than the Oriskany soil

38C—Oriskany gravelly fine sandy loam, 7 to 15 percent slopes, very stony

Composition (Informed judgment)

Oriskany soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 15 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Foot slopes (fig. 11)
Parent material: Colluvium derived from acid sandstone and shale
Shape of areas: Irregular
Size of areas: 5 to 100 acres

Typical Profile

0 to 6 inches—dark brown gravelly fine sandy loam
6 to 14 inches—yellowish brown very cobbly fine sandy loam
14 to 60 inches—strong brown extremely stony sandy clay loam

Inclusions

Contrasting inclusions:
• Areas of Craigsville soils, which are on flood plains along small streams, are subject to frequent flooding, and have less clay than the Oriskany soil
Similar inclusions:
• Areas of Murrill soils, which are scattered throughout the map unit and have fewer rock fragments throughout and more clay in the subsoil than the Oriskany soil
• Areas of Oriskany soils on 2 to 7 percent slopes
• Areas of soils, scattered throughout the map unit, that have more clay throughout than the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have more silt throughout than the Oriskany soil

38D—Oriskany gravelly fine sandy loam, 15 to 35 percent slopes, very stony

Composition (Statistical method, random points)

Confidence interval: 90 percent
Oriskany soil and similar inclusions: 91 to 98 percent
Contrasting inclusions: 2 to 9 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Foot slopes and back slopes
Parent material: Colluvium derived from acid sandstone and shale
Shape of areas: Irregular
Size of areas: 5 to 1,000 acres

Typical Profile

0 to 6 inches—dark brown gravelly fine sandy loam
6 to 14 inches—yellowish brown very cobbly fine sandy loam
14 to 60 inches—strong brown extremely stony sandy clay loam

Inclusions

Contrasting inclusions:
• Areas of Craigsville soils, which are on flood plains along small streams, are subject to frequent flooding, and have less clay than the Oriskany soil
• Areas of soils that have more than 35 percent clay, that have fewer rock fragments than the Oriskany soil, and that are scattered throughout the map unit
• Areas of soils that have a brittle layer in the subsoil and that are scattered throughout the map unit
• Areas of moderately deep soils that are generally on the higher landscapes of the map unit
Similar inclusions:
• Areas of Murrill soils, which are scattered throughout the map unit, have fewer rock fragments throughout, and have more clay in the subsoil than that in the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have more clay throughout than that in the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have more silt throughout than that in the Oriskany soil

38E—Oriskany gravelly fine sandy loam, 35 to 55 percent slopes, extremely stony

Composition (Statistical method, random points)

Confidence interval: 90 percent
Oriskany soil and similar inclusions: 87 to 97 percent
Contrasting inclusions: 3 to 13 percent

Setting

Landform: Ridges, spurs, and drainageways
Landscape position: Foot slopes and back slopes
Parent material: Colluvium derived from acid sandstone and shale
Shape of areas: Irregular
Size of areas: 5 to 200 acres

Typical Profile

0 to 6 inches—dark brown gravelly fine sandy loam
6 to 14 inches—yellowish brown very cobbly fine sandy loam
14 to 60 inches—strong brown extremely stony sandy clay loam

Inclusions

Contrasting inclusions:
• Areas of Lily soils, which are moderately deep, are in the higher landscape positions, and formed in residuum derived from sandstone
• Areas of soils, scattered throughout the map unit, that are more than 35 percent clay and that have fewer rock fragments than the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have a brittle layer in the subsoil
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that have more clay throughout than the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have more silt throughout than the Oriskany soil
• Areas of soils, scattered throughout the map unit, that have fewer rock fragments than the Oriskany soil

39D—Paddyknob-Rock outcrop complex, 15 to 35 percent slopes, extremely stony

Composition (Subjective judgment)

Paddyknob soil and similar inclusions: 70 to 75 percent
Rock outcrops: 15 to 20 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Mountains
Landscape position: Summits and shoulders
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 50 acres

Typical Profile

Paddyknob

2 inches to 0—partly decomposed and undecomposed loose leaves and twigs
0 to 4 inches—dark brown gravelly loam
4 to 10 inches—strong brown gravelly loam
10 to 21 inches—strong brown very gravelly sandy loam
21 to 26 inches—strong brown very gravelly loam
26 inches—sandstone

Rock outcrop

Sedimentary sandstone

Inclusions

Contrasting inclusions:
• Areas of Madsheep soils, which formed in residuum derived from shale, have more silt and less sand than the Paddyknob soil, are redder than the Paddyknob soil, and are in the lower landscape positions
Similar inclusions:
• Areas of Paddyknob channery loam scattered throughout the map unit
• Areas of Paddyknob sandy loam scattered throughout the map unit
• Areas of residual soils that are 10 to 20 inches deep to bedrock and that are scattered throughout the map unit, especially near rock outcrops
• Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

39E—Paddyknob-Rock outcrop complex, 35 to 80 percent slopes, extremely stony

Composition (Subjective judgment)

Paddyknob soil and similar inclusions: 65 to 70 percent
Rock outcrop: 20 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Mountains
Landscape position: Shoulders and the upper part of back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 100 acres

Typical Profile

Paddyknob

2 inches to 0—partly decomposed and undecomposed loose leaves and twigs
0 to 4 inches—dark brown gravelly loam, very stony
4 to 10 inches—strong brown gravelly loam
10 to 21 inches—strong brown very gravelly sandy loam
21 to 26 inches—strong brown very gravelly loam
26 inches—sandstone

Rock outcrop

Sedimentary sandstone

Inclusions

Contrasting inclusions:
• Areas of Madsheep soils, which are in the lower landscape positions, formed in residuum derived from shale, have more silt and less sand than the Paddyknob soil, and are redder than the Paddyknob soil
Similar inclusions:
• Areas of Paddyknob channery loam scattered throughout the map unit
• Areas of Paddyknob sandy loam scattered throughout the map unit
• Areas of residual soils that are 10 to 20 inches deep to bedrock and that are scattered throughout the map unit, especially near rock outcrop
• Areas of residual soils that are 40 to 60 inches deep to bedrock and that are scattered throughout the map unit

40D—Paddyknob gravelly sandy loam, 15 to 35 percent slopes, very stony

Composition (Subjective judgment)

Paddyknob soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Mountains
Landscape position: Summits and shoulders
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 50 acres

Typical Profile

2 inches to 0—partly decomposed and undecomposed loose leaves and twigs
0 to 4 inches—dark brown gravelly loam
4 to 10 inches—strong brown gravelly loam
10 to 21 inches—strong brown very gravelly sandy loam
21 to 26 inches—strong brown very gravelly loam
26 inches—sandstone

Inclusions

Contrasting inclusions:
• Areas of Madsheep soils, which are in the lower landscape positions, formed in residuum derived from shale, have more silt and less sand than the Paddyknob soil, and are redder than the Paddyknob soil
• Areas of rock outcrops that are scattered throughout the map unit
Similar inclusions:
• Areas of Paddyknob channery loam scattered throughout the map unit
• Areas of Paddyknob sandy loam scattered throughout the map unit
• Areas of residual soils that are 10 to 20 inches deep to bedrock and that are that are scattered throughout the map unit, especially near rock outcrops
• Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

40E—Paddyknob channery sandy loam, 35 to 55 percent slopes, very stony

Composition (Subjective judgment)

Paddyknob soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Mountains
Landscape position: Shoulders and the upper part of back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 60 acres

Typical Profile

2 inches to 0—partly decomposed and undecomposed loose leaves and twigs
0 to 4 inches—dark brown gravelly loam
4 to 10 inches—strong brown gravelly loam
10 to 21 inches—strong brown very gravelly sandy loam
21 to 26 inches—strong brown very gravelly loam
26 inches—sandstone

Inclusions

Contrasting inclusions:
• Areas of Madsheep soils, which are in the lower landscape positions, formed in residuum derived from shale, have more silt and less sand than the Paddyknob soil, and are redder than the Paddyknob soil
• Areas of rock outcrop scattered throughout the map unit
Similar inclusions:
• Areas of Paddyknob channery loam scattered throughout the map unit
• Areas of Paddyknob sandy loam scattered throughout the map unit
• Areas of residual soils that are 10 to 20 inches deep to bedrock and that are scattered throughout the map unit, especially near rock outcrop
• Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

41A—Philo fine sandy loam, 0 to 3 percent slopes, frequently flooded

Composition (Informed judgment)

Philo soil and similar inclusions: 80 to 100 percent
Contrasting inclusions: 0 to 20 percent

Setting

Landform: Flood plains
Landscape position: Toe slopes
Parent material: Alluvium derived from sandstone and shale
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 30 acres

Typical Profile

0 to 5 inches—very dark grayish brown fine sandy loam
5 to 20 inches—dark yellowish brown fine sandy loam
20 to 44 inches—olive brown fine sandy loam that has light brownish gray iron depletions and strong brown iron masses
44 to 60 inches—light olive brown very cobbly sandy loam that has light brownish gray iron depletions and strong brown iron masses

Inclusions

Contrasting inclusions:
- Areas of Coursey soils, which are moderately well drained, are in the higher landscape positions, are not subject to flooding, and have more clay than the Philo soil
- Areas of Grimsley soils, which have more rock fragments than the Philo soil and are on foot slopes
- Areas of well drained Pope soils that are in landscape positions subject to rare flooding
- Areas of poorly drained soils that are in the slightly lower landscape positions
- Areas of soils that were disturbed or covered during mining operations

Similar inclusions:
- Areas of well drained Craigsville soils that have more rock fragments than the Philo soil and that are in landscape positions similar to those of the Philo soil

42B—Pisgah silt loam, 2 to 7 percent slopes

Composition (Subjective judgment)

Pisgah soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

Setting

Landform: Valleys
Landscape position: Summits and shoulders (fig. 12 and fig. 13)
Parent material: Holston limestone
Shape of areas: Long and winding, or broad and irregular
Size of areas: 5 to 500 acres

Typical Profile

0 to 2 inches—dark brown silt loam
2 to 8 inches—brown silt loam

Figure 12.—Hayfield on Pisgah silt loam, 2 to 7 percent slopes.

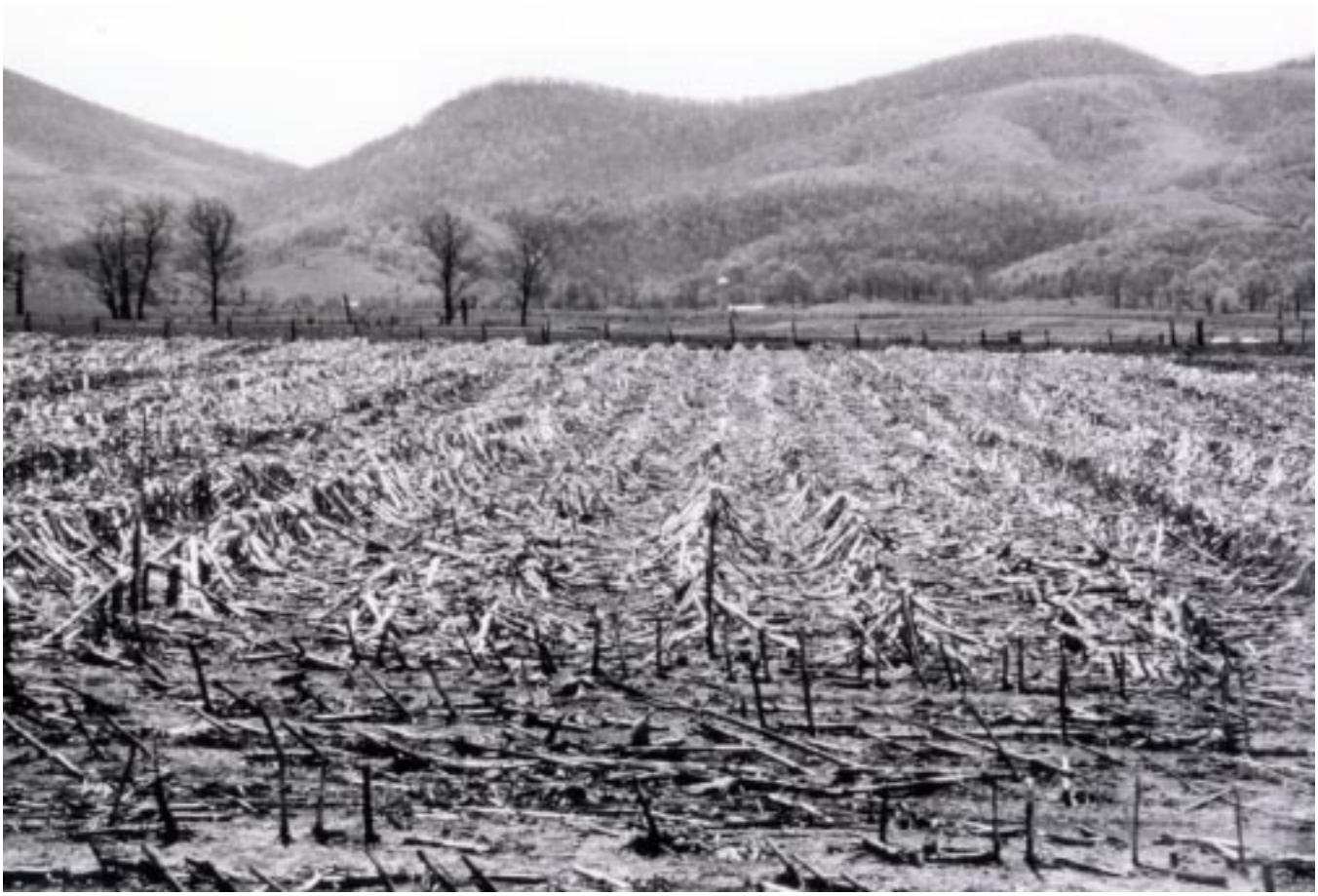

Figure 13.—Cultivated field on Pisgah silt loam, 2 to 7 percent slopes.

8 to 13 inches—brown clay loam
13 to 50 inches—yellowish brown clay
50 to 61 inches—yellowish brown, brown, and strong brown clay

Inclusions

Contrasting inclusions:
- Areas of Carbo soils, which are moderately deep, have more clay than the Pisgah soil, and are scattered throughout the map unit
- Areas of moderately well drained and somewhat poorly drained soils in depressions
- Areas of poorly drained soils in drainageways
- Areas of rock outcrop scattered throughout the map unit

Similar inclusions:
- Areas of soils, scattered throughout the map unit, that have a gravelly silt loam surface layer

42C—Pisgah silt loam, 7 to 15 percent slopes

Composition (Subjective judgment)

Pisgah soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

Setting

Landform: Valleys
Landscape position: Summits and shoulders
Parent material: Holston limestone
Shape of areas: Long and winding, or irregular
Size of areas: 5 to 50 acres

Typical Profile

0 to 2 inches—dark brown silt loam
2 to 8 inches—brown silt loam
8 to 13 inches—brown clay loam

13 to 50 inches—yellowish brown clay
50 to 61 inches—yellowish brown, brown, and strong brown clay

Inclusions

Contrasting inclusions:
• Areas of Carbo soils, which are moderately deep, have more clay than the Pisgah soil, and are scattered throughout the map unit
• Areas of moderately well drained and somewhat poorly drained soils in depressions
• Areas of poorly drained soils in drainageways
• Areas of rock outcrop scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that have a gravelly silt loam surface layer

43B—Pisgah silt loam, karst, 2 to 7 percent slopes

Composition (Subjective judgment)

Pisgah soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent
Karst: 2 to 5 sinkholes per 5 acres

Setting

Landform: Valleys
Landscape position: Summits and shoulders
Parent material: Holston limestone
Shape of areas: Long and winding, or broad and irregular
Size of areas: 5 to 650 acres

Typical Profile

0 to 2 inches—dark brown silt loam
2 to 8 inches—brown silt loam
8 to 13 inches—brown clay loam
13 to 50 inches—yellowish brown clay
50 to 61 inches—yellowish brown, brown, and strong brown clay

Inclusions

Contrasting inclusions:
• Areas of Carbo soils, which are moderately deep and have more clay than the Pisgah soil
• Areas of moderately well drained and somewhat poorly drained soils in sinks and depressions
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that have a gravelly silt loam surface layer

43C—Pisgah silt loam, karst, 7 to 15 percent slopes

Composition (Subjective judgment)

Pisgah soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent
Karst: 2 to 5 sinkholes per 5 acres

Setting

Landform: Valleys
Landscape position: Summits and shoulders
Parent material: Holston limestone
Shape of areas: Long and winding, or broad and irregular
Size of areas: 5 to 450 acres

Typical Profile

0 to 2 inches—dark brown silt loam
2 to 8 inches—brown silt loam
8 to 13 inches—brown clay loam
13 to 50 inches—yellowish brown clay
50 to 61 inches—yellowish brown, brown, and strong brown clay

Inclusions

Contrasting inclusions:
• Areas of Carbo soils, which are moderately deep and have more clay than the Pisgah soil
• Areas of moderately well drained and somewhat poorly drained soils in sinks and depressions
• Areas of poorly drained soils in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of soils, scattered throughout the map unit, that have a gravelly silt loam surface layer

44—Pits, quarry

Composition (Subjective judgment)

Pits and quarries: 100 percent

Setting

Landform: Hills
Landscape position: Variable
Parent material: Limestone
Shape of areas: Irregular
Size of areas: 20 to 100 acres

Figure 14.—Hayland in the foreground and pasture in the middleground on Pope fine sandy loam, 0 to 2 percent slopes, rarely flooded.

45A—Pope fine sandy loam, 0 to 2 percent slopes, rarely flooded

Composition (Modified statistical method, systematic points)

Pope soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains
Landscape position: Toe slopes (fig. 14 and fig. 15)
Parent material: Alluvium derived from acid sandstone and shale
Shape of areas: Long and narrow, or irregular
Size of areas: 3 to 100 acres

Typical Profile

0 to 8 inches—dark yellowish brown fine sandy loam
8 to 15 inches—dark brown gravelly sandy loam
15 to 27 inches—strong brown sandy loam
27 to 45 inches— strong brown gravelly sandy loam
45 to 64 inches— strong brown very gravelly loamy sand

Inclusions

Contrasting inclusions:
- Areas of Philo soils, which are moderately well drained, are subject to frequent flooding, and are in the lower landscape positions of the map unit
- Areas of soils that have a thicker, darker surface layer and that are in landscape positions similar to those of the Pope soil
- Areas of somewhat poorly drained soils that have more clay than the Pope soil and that are in landscape positions similar to or higher than those of the Pope soil
- Areas of somewhat poorly drained soils that are subject to occasional flooding and that are in the lower landscape positions of the unit
- Areas of moderately well drained soils that are subject to occasional flooding and that are in the lower landscape positions of the unit

• Areas of moderately well drained soils, on terraces, that have more clay and less sand than the Pope soil
Similar inclusions:
• Areas of Craigsville soils, which are subject to frequent flooding and are in landscape positions lower than those of the Pope soil and in old stream channels
• Areas of soils that have more sand and less clay than the Pope soil, that are subject to occasional flooding, and that are in landscape positions lower than those of the Pope soil and in old stream channels
• Areas of soils that have more clay and silt but less sand than the Pope soil and that are in landscape positions similar to those of the Pope soil
• Areas of soils that are redder than the Pope soil

46C—Poplimento-Westmoreland complex, 7 to 15 percent slopes

Composition (Subjective judgment)

Poplimento soil and similar inclusions: 40 to 50 percent
Westmoreland soil and similar inclusions: 35 to 45 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Shale interbedded with limestone
Shape of areas: Long and narrow, or irregular
Size of areas: 3 to 200 acres

Typical Profile

Poplimento

0 to 6 inches—dark brown silt loam
6 to 11 inches—yellowish brown silty clay loam
11 to 35 inches—yellowish brown silty clay
35 to 45 inches—yellowish brown clay
45 to 56 inches—yellowish brown channery silty clay loam
56 to 62 inches—yellowish brown silty clay loam

Westmoreland

0 to 7 inches—dark brown silt loam
7 to 31 inches—strong brown silty clay loam

Figure 15.—Tobacco field and storage barn on Pope fine sandy loam, 0 to 2 percent slopes, rarely flooded.

31 to 47 inches—brown channery silt loam
47 to 61 inches—brown very channery silty clay loam

Inclusions

Contrasting inclusions:
• Areas of Berks soils, which are moderately deep, have more shale fragments than the Poplimento and Westmoreland soils, and are in convex, higher areas of the map unit or in landscape positions similar to those of the Poplimento and Westmoreland soils
• Areas of Guernsey soils, which are moderately well drained and on the gentler slopes in the lower areas of the map unit
• Areas of Oriskany soils, which are in drainageways, formed in colluvium derived from sandstone and shale, and have more rock fragments than the Poplimento and Westmoreland soils
Similar inclusions:
• Areas of deep soils that have a thicker solum than the Westmoreland soil and that are in similar landscape positions
• Areas of deep, fine soils that have a thinner solum than the Poplimento soil and that are in similar landscape positions
• Areas of soils that have shale fragments throughout the profile, that overlie limestone, and that are adjacent to Bland soils and in landscape positions similar to those of the Poplimento and Westmoreland soils
• Areas of moderately deep, fine-loamy soils that are in landscape positions similar to those of the Poplimento and Westmoreland soils

46D—Poplimento-Westmoreland complex, 15 to 25 percent slopes

Composition (Statistical method, random points)

Confidence interval: 80 percent
Poplimento soil and similar inclusions: 47 to 69 percent
Westmoreland soil and similar inclusions: 24 to 42 percent
Contrasting inclusions: 1 to 18 percent

Setting

Landform: Hills and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Shale interbedded with limestone
Shape of areas: Long and narrow, or irregular
Size of areas: 3 to 250 acres

Typical Profile

Poplimento

0 to 6 inches—dark brown silt loam
6 to 11 inches—yellowish brown silty clay loam
11 to 35 inches—yellowish brown silty clay
35 to 45 inches—yellowish brown clay
45 to 56 inches—yellowish brown channery silty clay loam
56 to 62 inches—yellowish brown silty clay loam

Westmoreland

0 to 7 inches—dark brown silt loam
7 to 31 inches—strong brown silty clay loam
31 to 47 inches—brown channery silt loam
47 to 61 inches—brown very channery silty clay loam

Inclusions

Contrasting inclusions:
• Areas of moderately deep Berks soils that have more shale fragments than those in the Poplimento and Westmoreland soils and that are in convex, higher areas and in landscape positions similar to those of the Poplimento and Westmoreland soils
• Areas of Oriskany soils, in drainageways, that formed in colluvium derived from sandstone and shale and that have more rock fragments than those in the Poplimento and Westmoreland soils
• Areas of Clayey soils, in drainageways, that formed in colluvium derived from sandstone and shale
Similar inclusions:
• Areas of Murrill soils, in drainageways, that formed in colluvium derived from sandstone and shale and that have a surface layer and subsoil more than 60 inches thick
• Areas of deep, fine soils that have a thinner solum than that in the Poplimento soil and that are in landscape positions similar to those of the Poplimento soil
• Areas of deep soils that have a thicker solum than that in the Westmoreland soil and that are in landscape positions similar to those of the Westmoreland soil
• Areas of moderately deep, fine soils in landscape positions similar to those of the Poplimento and Westmoreland soils
• Areas of moderately deep, fine-loamy soils in landscape positions similar to those of the Poplimento and Westmoreland soils

47A—Purdy silt loam, 0 to 2 percent slopes

Composition (Informed judgment)

Purdy soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Terrace treads
Landscape position: Foot slopes
Parent material: Old alluvium and colluvium derived from limestone, shale, siltstone, and sandstone
Shape of areas: Long and winding
Size of areas: 5 to 60 acres

Typical Profile

0 to 6 inches—grayish brown silt loam
6 to 14 inches—grayish brown silt loam that has strong brown iron masses
14 to 31 inches—grayish brown silty clay that has strong brown iron masses
31 to 42 inches—gray clay that has yellowish brown iron masses
42 to 47 inches—gray silty clay that has brownish yellow and dark reddish brown iron masses
47 to 61 inches—gray gravelly clay loam that has strong brown iron masses

Inclusions

Contrasting inclusions:
• Areas of moderately well drained Guernsey soils in landscape positions similar to those of the Purdy soil and in slightly higher spots
• Areas of moderately well drained Coursey soils in landscape positions similar to or slightly higher than those of the Purdy soil
• Areas of moderately deep, poorly drained soils
Similar inclusions:
• Areas of somewhat poorly drained soils in landscape positions similar to those of the Purdy soil

48B—Timberville silt loam, 2 to 7 percent slopes, frequently flooded

Composition (Subjective judgment)

Soils and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Hills and drainageways
Landscape position: Toe slopes
Parent material: Limestone, sandstone, and shale derived from colluvium and alluvium
Shape of areas: Long and narrow to moderately broad
Size of areas: 5 to 50 acres

Typical Profile

0 to 12 inches—dark yellowish brown silt loam
12 to 25 inches—brown silty clay loam
25 to 35 inches—reddish brown gravelly silty clay
35 to 61 inches—dark reddish brown silty clay

Inclusions

Contrasting inclusions:
• Areas of soils that have more than 35 percent rock fragments and that are in landscape positions similar to those of the Timberville soil
• Areas of soils that have a brittle layer and that are in landscape positions similar to those of the Timberville soil
• Areas of moderately well drained soils in drainageways
Similar inclusions:
• Areas of Frederick soils, which have a Bt horizon within 20 inches of the surface and are in the higher landscape positions of the map unit
• Areas of karst, mostly near Ward's Cove, in landscape positions similar to those of the Timberville soil

49B—Tumbling loam, 2 to 7 percent slopes, very stony

Composition (Subjective judgment)

Tumbling soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Mountains
Landscape position: Foot slopes
Parent material: Colluvium derived from sandstone, quartzite, and shale
Shape of areas: Irregular
Size of areas: 5 acres

Typical Profile

0 to 9 inches—dark yellowish brown loam
9 to 16 inches—yellowish brown clay loam
16 to 44 inches—strong brown clay loam
44 to 62 inches—yellowish red clay loam that has yellowish brown, soft masses of iron accumulation

Inclusions

Contrasting inclusions:
• Areas of Craigsville soils, which are on flood plains along small streams, are subject to frequent flooding, and have less clay than the Tumbling soil
• Areas of Berks soils, which are moderately deep, are on residual uplands, and have more rock fragments than the Tumbling soil

49C—Tumbling loam, 7 to 15 percent slopes, very stony

Composition (Subjective judgment)

Tumbling soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Mountains
Landscape position: Foot slopes
Parent material: Colluvium derived from sandstone, quartzite, and shale
Shape of areas: Irregular
Size of areas: 4 acres

Typical Profile

0 to 9 inches—dark yellowish brown loam
9 to 16 inches—yellowish brown clay loam
16 to 44 inches—strong brown clay loam
44 to 62 inches—yellowish red clay loam that has yellowish brown, soft masses of iron accumulation

Inclusions

Contrasting inclusions:
• Areas of Craigsville soils, which are subject to frequent flooding, have less clay than the Tumbling soil, and are on flood plains along small streams
• Areas of Berks soils, which are moderately deep, have more rock fragments than the Tumbling soil, and are on residual uplands

50—Udorthents-Urban land complex

Composition (Subjective judgment)

Udorthents soil and similar inclusions: 40 to 50 percent
Urban land: 25 to 35 percent
Contrasting inclusions: 20 to 30 percent

Setting

Landform: Cut and filled areas
Landscape position: Variable
Parent material: Udorthents formed in limestone, sandstone, and shale intermingled with some coal fragments
Shape of areas: Irregular, or very long and narrow
Size of areas: 5 to 500 acres

Typical Profile

Udorthents
Typical profile not described because of variable soil properties
0 to 5 inches—variable color, texture, and composition
5 to 15 inches or more ranging to several feet—variable material, color, texture, and composition

Urban land

Highways, streets, parking lots, and buildings

Inclusions

Contrasting inclusions:
• Areas of Allegheny soils, which formed in alluvium on terraces and are very deep and well drained
• Areas of Berks soils, which formed in residuum derived from shale and are moderately deep and well drained
• Areas of Bland and Carbo soils, which formed in residuum of limestone and are moderately deep and well drained
• Areas of Cedarcreek soils, which formed in mine spoil and are very deep and well drained
• Areas of Coursey soils, which are very deep and moderately well drained, formed in alluvium, and are on terraces
• Areas of Frederick soils, which formed in residuum derived from limestone and are very deep and well drained
• Areas of Grimsley soils, which formed in colluvium and are deep and well drained
• Areas of Guernsey soils, which formed in colluvium over residuum and are very deep and moderately well drained
• Areas of Lindside soils, which are very deep and moderately well drained, are on flood plains, formed in alluvium, and are subject to occasional flooding
• Areas of Melvin soils, which are very deep and poorly drained, are on flood plains, formed in alluvium, and are subject to frequent flooding
• Areas of Murrill and Oriskany soils, which are very deep, well drained, and colluvial
• Areas of Newark soils, which are very deep, somewhat poorly drained, and alluvial, are on flood plains, and are subject to occasional flooding
• Areas of Poplimento soils, which formed in residuum derived from shale and are very deep and well drained
• Areas of Westmoreland soils, which formed in

residuum derived from shale and are deep and well drained

51D—Wallen-Rock outcrop complex, 15 to 35 percent slopes, extremely stony

Composition (Subjective judgment)

Wallen soil and similar inclusions: 60 to 70 percent
Rock outcrops: 20 to 30 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Summits and shoulders
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 100 acres

Typical Profile

Wallen

0 to 4 inches—very dark brown channery sandy loam
4 to 22 inches—yellowish brown very channery sandy loam
22 to 24 inches—yellowish brown and strong brown extremely channery sandy loam
24 inches—sandstone

Rock outcrop

Sandstone

Inclusions

Contrasting inclusions:
• Areas of Calvin soils, which are in the lower landscape positions of the map unit, formed in shale, and have more silt and less sand and are redder than the Wallen soil
• Areas of Oriskany soils, which are very deep and colluvial and in drainageways
Similar inclusions:
• Areas of Wallen channery loam scattered throughout the map unit
• Areas of Wallen sandy loam scattered throughout the map unit
• Areas of residual soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

51E—Wallen-Rock outcrop complex, 35 to 80 percent slopes, extremely stony

Composition (Subjective judgment)

Wallen soil and similar inclusions: 60 to 70 percent
Rock outcrops: 20 to 30 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 200 acres

Typical Profile

Wallen

0 to 4 inches—very dark brown channery sandy loam
4 to 22 inches—yellowish brown very channery sandy loam
22 to 24 inches—yellowish brown and strong brown extremely channery sandy loam and loamy sand
24 inches—sandstone

Rock outcrop

Sedimentary sandstone

Inclusions

Contrasting inclusions:
• Areas of Calvin soils, which are in the lower landscape positions of the map unit, formed in shale, and have more silt and less sand and are redder than the Wallen soil
• Areas of Oriskany soils, which are very deep and colluvial and are in drainageways
Similar inclusions:
• Areas of Wallen channery loam scattered throughout the map unit
• Areas of Wallen sandy loam scattered throughout the map unit
• Areas of residual soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

52C—Wallen channery sandy loam, 7 to 15 percent slopes, very stony

Composition (Subjective judgment)

Wallen soil and similar inclusions: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Summits and shoulders
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 5 to 150 acres

Typical Profile

0 to 4 inches—very dark brown channery sandy loam
4 to 22 inches—yellowish brown very channery sandy loam
22 to 24 inches—yellowish brown and strong brown extremely channery sandy loam
24 inches—white and yellow sandstone

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep and colluvial and in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Wallen channery loam scattered throughout the map unit
• Areas of Wallen sandy loam scattered throughout the map unit
• Areas of Calvin soils, which are in the lower areas of the map unit, formed in shale, and have more silt and less sand and are redder than the Wallen soil
• Areas of residual soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock
• Areas of residual soils, scattered throughout the map unit, that have fewer rock fragments in the soil profile than those in the Wallen soil

52D—Wallen channery sandy loam, 15 to 35 percent slopes, very stony

Composition (Subjective judgment)

Wallen soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Summits, shoulders, and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow to moderately broad
Size of areas: 10 to 250 acres

Typical Profile

0 to 4 inches—very dark brown channery sandy loam
4 to 22 inches—yellowish brown very channery sandy loam
22 to 24 inches—yellowish brown and strong brown extremely channery sandy loam and loamy sand
24 inches—white and yellow sandstone

Inclusions

Contrasting inclusions:
• Areas of Oriskany soils, which are very deep and colluvial and are in drainageways
• Areas of rock outcrops scattered throughout the map unit
Similar inclusions:
• Areas of Wallen channery loam scattered throughout the map unit
• Areas of Wallen sandy loam scattered throughout the map unit
• Areas of Calvin soils, which are in the lower areas of the map unit, formed in shale, and have more silt and less sand and are redder than the Wallen soil
• Areas of residual soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
• Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

52E—Wallen channery sandy loam, 35 to 65 percent slopes, very stony

Composition (Subjective judgment)

Wallen soil and similar inclusions: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Ridges
Landscape position: Shoulders and back slopes
Parent material: Sandstone
Shape of areas: Irregular, or long and narrow
Size of areas: 5 to 60 acres

Typical Profile

0 to 4 inches—very dark brown channery sandy loam
4 to 22 inches—yellowish brown very channery sandy loam
22 to 24 inches—yellowish brown and strong brown extremely channery sandy loam and loamy sand
24 inches—white and yellow sandstone

Inclusions

Contrasting inclusions:
- Areas of Oriskany soils, which are very deep and colluvial and are in drainageways
- Areas of rock outcrops scattered throughout the map unit

Similar inclusions:
- Areas of Wallen channery loam scattered throughout the map unit
- Areas of Wallen sandy loam scattered throughout the map unit
- Areas of Calvin soils, which are in the lower areas of the map unit, formed in shale, and have more silt and less sand and are redder than the Wallen soil
- Areas of residual soils, scattered throughout the map unit, that are 10 to 20 inches deep to bedrock
- Areas of residual soils, scattered throughout the map unit, that are 40 to 60 inches deep to bedrock

53E—Westmoreland-Poplimento-Berks complex, 25 to 35 percent slopes

Composition (Modified statistical method, systematic points)

Confidence interval: 80 percent
Westmoreland soil and similar inclusions: 50 to 70 percent
Poplimento soil and similar inclusions: 15 to 30 percent
Berks soil and similar inclusions: 15 to 25 percent
Contrasting inclusions: 2 to 15 percent

Setting

Landform: Ridges and spurs
Landscape position: Summits, shoulders, and back slopes
Parent material: Westmoreland and Poplimento, shale interbedded with limestone; Berks, shale interbedded with fine grained sandstone and siltstone
Shape of areas: Long and narrow, or irregular
Size of areas: 3 to 550 acres

Typical Profile

Westmoreland

0 to 7 inches—dark brown silt loam
7 to 31 inches—strong brown silty clay loam
31 to 47 inches—brown channery silt loam
47 to 61 inches—brown very channery silty clay loam

Poplimento

0 to 6 inches—dark brown silt loam
6 to 11 inches—yellowish brown silty clay loam
11 to 35 inches—yellowish brown silty clay
35 to 45 inches—yellowish brown clay
45 to 56 inches—yellowish brown channery silty clay loam
56 to 62 inches—yellowish brown silty clay loam

Berks

0 to 6 inches—yellowish brown channery silt loam
6 to 14 inches—yellowish brown very channery silt loam
14 to 24 inches—yellowish brown extremely channery silty clay loam
24 to 33 inches—yellowish brown extremely channery silt loam
33 inches—weathered shale

Inclusions

Contrasting inclusions:
- Areas of Bland soils, which formed in argillaceous limestone and are in the lower landscape positions of the map unit
- Areas of Oriskany soils, which are in drainageways, formed in colluvium derived from sandstone and shale, and have more rock fragments than the Westmoreland, Poplimento, and Berks soils

Similar inclusions:
- Areas of Murrill soils, which are in drainageways, formed in colluvium derived from sandstone and shale, and have a surface layer and a subsoil more than 60 inches thick
- Areas of Weikert soils, which are shallow and are in the convex, higher landscape positions of the map unit
- Areas of clayey soils, in drainageways, that formed in colluvium derived from sandstone and shale
- Areas of deep, fine-loamy soils that have a thicker solum than the Westmoreland soil and that are in landscape positions similar to those of the Westmoreland soil
- Areas of deep, fine soils that have a thinner solum than the Poplimento soil and that are in landscape positions similar to those of the Poplimento soil
- Areas of deep and very deep soils that have more rock fragments than the Westmoreland, Poplimento, and Berks soils and that are in landscape positions similar to those of the Westmoreland, Poplimento, and Berks soils

53F—Westmoreland-Poplimento-Berks complex, 35 to 65 percent slopes

Composition (Statistical method, random points)

Confidence interval: 80 percent
Westmoreland soil and similar inclusions: 35 to 51 percent
Poplimento soil and similar inclusions: 25 to 41 percent
Berks soil and similar inclusions: 14 to 27 percent
Contrasting inclusions: 0 to 7 percent

Setting

Landform: Ridges and spurs
Landscape position: Shoulders and back slopes
Parent material: Westmoreland and Poplimento, shale interbedded with limestone; Berks, shale interbedded with fine grained sandstone and siltstone
Shape of areas: Long and narrow to broad, or irregular
Size of areas: 3 to 1,050 acres

Typical Profile

Westmoreland

0 to 7 inches—dark brown silt loam
7 to 31 inches—strong brown silty clay loam
31 to 47 inches—brown channery silt loam
47 to 61 inches—brown very channery silty clay loam

Poplimento

0 to 6 inches—dark brown silt loam
6 to 11 inches—yellowish brown silty clay loam
11 to 35 inches—yellowish brown silty clay
35 to 45 inches—yellowish brown clay
45 to 56 inches—yellowish brown channery silty clay loam
56 to 62 inches—yellowish brown silty clay loam

Berks

0 to 6 inches—dark yellowish brown channery silt loam
6 to 14 inches—yellowish brown very channery silt loam
14 to 24 inches—yellowish brown extremely channery silty clay loam
24 to 33 inches—yellowish brown extremely channery silt loam
33 inches—weathered shale

Inclusions

Contrasting inclusions:
- Areas of Carbo soils, which are in the lower landscape positions of the unit, formed in limestone, and are more than 60 percent clay
- Areas of Oriskany soils, which are in drainageways, formed in colluvium derived from sandstone and shale, and have more rock fragments than the Westmoreland, Poplimento, and Berks soils
- Areas of shallow, clayey soils, on nose slopes, that formed in limestone

Similar inclusions:
- Areas of Murrill soils, which are in drainageways, formed in colluvium derived from sandstone and shale, and have a surface layer and subsoil more than 60 inches thick
- Areas of Newbern soils, which are shallow and loamy and are on nose slopes
- Areas of Timberville soils, which are on the lower foot slopes and on toe slopes and formed in alluvium and colluvium in drainageways
- Areas of Weikert soils, which are shallow and on nose slopes
- Areas of fine soils that are 40 to 60 inches deep to bedrock and that are in landscape positions similar to those of the Westmoreland, Poplimento, and Berks soils
- Areas of moderately deep, fine soils that are in landscape positions similar to those of the Westmoreland, Poplimento, and Berks soils
- Areas of fine soils that have a surface layer and a subsoil more than 60 inches thick and that are in landscape positions similar to those of the Westmoreland, Poplimento, and Berks soils
- Areas of moderately deep, fine-loamy soils that are in landscape positions similar to those of the Westmoreland, Poplimento, and Berks soils
- Areas of deep soils that have a thicker solum than the Westmoreland soil and that are in landscape positions similar to those of the Westmoreland, Poplimento, and Berks soils
- Areas of deep and very deep soils that have more rock fragments than those in the Poplimento, Westmoreland, and Berks soils and that are in landscape positions similar to those of the Poplimento, Westmoreland, and Berks soils

54A—Wolfgap clay loam, 0 to 2 percent slopes, occasionally flooded

Composition (Subjective judgment)

Wolfgap soil and similar inclusions: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains
Landscape position: Toe slopes

Parent material: Alluvium derived from limestone, shale, sandstone, and shale
Shape of areas: Irregular
Size of areas: 2 acres

Typical Profile

0 to 11 inches—dark brown clay loam
11 to 35 inches—yellowish brown sandy clay loam
35 to 58 inches—strong brown sandy clay loam
58 to 72 inches— strong brown extremely gravelly fine sandy loam

Inclusions

Contrasting inclusions:
• Areas of Botetourt soils, which are moderately well drained and are on terrace risers

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland has been defined by the U.S. Department of Agriculture. It is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It is available for these uses. It could be cultivated land, pastureland, forest land, or other land. But, it is not urban or built-up land or water areas.

Prime farmland requires proper management, including water management, and acceptable farming methods. Under these conditions, it has the soil qualities, growing season, and moisture supply needed for economical, sustained production and high yields of crops. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. It has a favorable temperature and growing season and acceptable acidity or alkalinity. And, it has an acceptable salt and sodium content and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods. It either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 14,900 acres in the survey area, or nearly 4.6 percent of the total acreage, meets the soil requirements for prime farmland. Areas of prime farmland are scattered throughout the county. Most areas are in the limestone valley and on stream deposits, mainly in the Frederick-Carbo-Bland and Guernsey-Craigsville-Melvin associations described in "General Soil Map Units."

A recent trend in land use in some parts of the survey area 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.

The map units in the survey area that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. On some soils included in the list, 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. The extent of each listed map unit is shown in table 5. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed for each soil and the system of land capability classification used by the Natural Resources Conservation Service is explained.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the 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 7. 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 of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

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

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local

office of the Natural Resources Conservation Service or 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 woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

The capability classification of the map units in this survey area is given in table 7, “Land Capability and Yields per Acre of Crops and Pasture.”

Woodland Management and Productivity

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

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

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion.

Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class* 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 woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

In *productivity class*, the numbers are given for indicator and other species. Refer to the paragraph on ordination symbol above for an explanation of the numbers used under productivity class.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated

by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in the table can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 14 and interpretations for dwellings without basements and for local roads and streets in table 11.

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

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

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

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

Elements of Wildlife Habitat

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and

legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

Habitat for Various Kinds of Wildlife

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, meadow vole, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, tree swallow, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the 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, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Generalized corrective measures for limitations for dwellings are listed in table 12. These are not recommendations. However, they will provide a means for overcoming the limiting factor.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Generalized corrective measures for limitations for lawns and landscaping are listed in table 13. These are not recommendations. However, they will provide a means for overcoming the limiting factor.

Sanitary Facilities

Table 14 shows the degree and kind of soil limitations that affect septic tank absorption fields,

sewage lagoons, sanitary landfills, and daily cover for landfill. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Generalized corrective measures for limitations that affect the performance of septic tank absorption fields are listed in table 15. These are not recommendations. However, they will provide a means for overcoming the limiting factor.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope

affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble

salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 17 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 and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 18 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 19 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent;

moderate, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, more than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In 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 or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 20 gives estimates of various soil and 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.

If a soil is assigned to two hydrologic groups in the table, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding 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 flooding is more than 50 percent in any year). *Common* is used when the occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a

saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched, apparent, or artesian; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. “More than 6.0” indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*4*). 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. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning humid, plus *ent*, 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 Fluvaquents (*Fluv*, meaning produced by river action, plus *aquent*, the suborder of the Entisols 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 Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, nonacid, mesic Typic Fluvaquents.

SERIES. The series consists of soils 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" (*6*). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (*4*) and in "Keys to Soil Taxonomy" (*5*). 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.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Allegheny Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Physiographic provinces: Valley and Ridge and Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Terrace treads and risers
Parent material: Alluvium derived from sandstone, shale, and limestone

Slope range: 0 to 7 percent

Associated Soils

- Areas of moderately deep Carbo soils, which formed in residuum derived from limestone and have more clay than Allegheny soils
- Areas of moderately well drained Coursey soils, on terraces, which are on landscapes similar to or lower than those of Allegheny soils
- Areas of Frederick soils, which formed in limestone residuum and have more clay than Allegheny soils

Typical Pedon

Allegheny loam, 2 to 7 percent slopes, about 10 miles east-southeast of Richlands, about 8.75 miles southwest of Tazewell, 150 feet south of VA-604, latitude of 37 degrees, 1 minute, 16 seconds N.; longitude of 81 degrees, 37 minutes, 58 seconds W.; in Pounding Mill in the Virginia Quadrangle; in a hayfield:

Ap—0 to 5 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine vesicular and tubular pores; slightly acid; clear smooth boundary.

BA—5 to 11 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine vesicular and tubular pores; 3 percent sandstone gravel; moderately acid; clear wavy boundary.

Bt1—11 to 24 inches; brown (7.5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular and tubular pores; common discontinuous faint clay films on faces of peds; 8 percent sandstone gravel; moderately acid; clear wavy boundary.

Bt2—24 to 32 inches; brown (7.5YR 4/4) gravelly sandy clay loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular and tubular pores; few discontinuous faint clay films on faces of peds; 25 percent sandstone gravel; strongly acid; clear wavy boundary.

BC—32 to 48 inches; strong brown (7.5YR 4/6) very gravelly sandy loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; few very fine roots; many very fine vesicular and tubular pores; 35 percent sandstone gravel; very strongly acid; gradual wavy boundary.

C—48 to 61 inches; strong brown (7.5YR 4/6) very gravelly sandy loam; single grained; loose, nonsticky and nonplastic; many very fine vesicular and tubular pores; 35 percent sandstone gravel and 20 percent sandstone cobbles; very strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragment content: Mostly sandstone gravel; 0 to 15 percent in the A horizon, 0 to 30 percent in the Bt horizon, and 0 to 60 percent in the BC and C horizons
Reaction: Very strongly acid to moderately acid throughout

Ap horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—loam

BA or BE horizon (where either occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—sandy loam to silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—clay loam, sandy clay loam, loam, silt loam, or silty clay loam and more than 15 percent sand coarser than very fine sand

BC horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—4 to 8
Texture—fine sandy loam, loam, sandy clay loam, clay loam, or their gravelly analog

C horizon (where it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—sandy clay loam, clay loam, loam, fine sandy loam, sandy loam, or their gravelly analog

2C horizon (where it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—stratified layers ranging from sand to loam or their gravelly, very gravelly, and extremely gravelly analogs

Alticrest Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Physiographic province: Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Ridges and spurs
Parent material: Sandstone
Slope range: 5 to 40 percent

Associated Soils

- Areas of very deep Cedarcreek soils, which formed in regolith from surface mining operations, have more rock fragments and less sand than Alticrist soils, and are on shoulders, back slopes, foot slopes, and toe slopes on landscapes similar to or lower than those of Alticrest soils
- Areas of deep Grimsley soils, which formed in colluvium derived from sandstone and shale, have more rock fragments and less sand than Alticrist soils, and are on ridges and spur ridges on landscapes lower than those of Alticrest soils, and in drainageways
- Areas of Lily soils, which have more clay and less sand than Alticrest soils and are on landscapes similar to those of Alticrest soils

Typical Pedon

Alticrest fine sandy loam, 25 to 40 percent slopes, about 3.5 miles north-northeast of Richlands, 5.3 miles south of intersection of VA-616 and VA-621 in Jewell Ridge, on side slope 1,500 feet to the east; latitude of 37 degrees, 8 minutes, 45.4 seconds N. and longitude of 81 degrees, 45 minutes, 45.6 seconds W.; on Jewell Ridge, in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; hardwood twigs and leaf litter.
A—0 to 3 inches; dark brown (10YR 4/3) fine sandy loam; moderate fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; common fine vesicular and tubular pores; 5 percent sandstone channers; very strongly acid; clear smooth boundary.
Bw1—3 to 10 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; many fine and medium roots; common fine vesicular and tubular pores; 5 percent sandstone channers; very strongly acid; clear smooth boundary.
Bw2—10 to 25 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common fine and medium roots; common fine vesicular and tubular pores; 10 percent sandstone channers; very strongly acid; clear smooth boundary.
Bw3—25 to 35 inches; yellowish brown (10YR 5/6) sandy loam; weak coarse subangular blocky structure; friable, nonsticky and nonplastic; few fine and medium roots; common fine vesicular and tubular pores; 5 percent sandstone channers; very strongly acid; abrupt wavy boundary.
R—35 inches; unweathered sandstone.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Sandstone or orthoquartzite fragments less than 3 inches in diameter; 0 to 15 percent in each horizon
Reaction: Very strongly acid or strongly acid throughout, unless limed

A horizon:
Hue—7.5YR or 10YR
Value—3 to 4
Chroma—2 to 4
Texture—fine sandy loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam, sandy loam, or fine sandy loam

BC horizon (where it occurs):
Hue—7.5YR or 10YR
Value—4 to 7
Chroma—3 to 8
Texture—sandy loam or fine sandy loam

C horizon (where it occurs):
Hue—7.5YR or 10YR
Value—5 to 7
Chroma—3 to 6
Texture—sand, loamy sand, or sandy loam

Berks Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate or moderately rapid
Physiographic provinces: Valley and Ridge and Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Ridges and spurs
Parent material: Acid shale interbedded with fine grained sandstone and siltstone
Slope range: 7 to 70 percent

Associated Soils

- Areas of Bland soils, which formed in residuum derived from limestone, have more clay and fewer rock fragments than Berks soils, and are on hills and spur ridges on landscapes lower than those of Berks soils
- Areas of Brushy soils, which formed in residuum derived from cherty limestone, have chert fragments, and are on hills and spur ridges on landscapes lower than those of Berks soils
- Areas of Calvin soils, which are redder than Berks soils and are on ridges on landscapes higher than those of Berks soils
- Areas of very deep Cedarcreek soils, which formed in regolith from surface mining operations and are on shoulders, back slopes, foot slopes, and toe slopes on landscapes similar to or lower than those of Berks soils
- Areas of Gilpin soils, which have more clay and fewer shale fragments than Berks soils and are on landscapes similar to those of Berks soils
- Areas of deep Grimsley soils, which formed in colluvium derived from sandstone and shale, have sandstone fragments, and are on ridges and spur ridges on landscapes similar to or lower than those of Berks soils, and in drainageways
- Areas of Lily soils, which formed in residuum derived from sandstone, have fewer rock fragments than Berks soils, and are on landscapes similar to or higher than those of Berks soils
- Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone, siltstone, and shale, have sandstone fragments, and are on ridges and spur ridges on landscapes similar to or lower than those of Berks soils, and in drainageways
- Areas of very deep Poplimento soils, which have more clay and fewer shale fragments than Berks soils and are on spur ridges and the lower hills on landscapes similar to those of Berks soils
- Areas of Wallen soils, which formed in residuum derived from sandstone, have more sand and less clay than Berks soils, and are on ridges on higher landscapes than those of Berks soils
- Areas of shallow Weikert soils on landscapes similar to those of Berks soils
- Areas of deep Westmoreland soils, which have fewer shale fragments than Berks soils and are on spur ridges and the lower hills on landscapes similar to those of Berks soils

Typical Pedon

Berks channery silt loam, in an area of Berks-Weikert complex, 35 to 55 percent slopes, about 6.75 miles south of Tazewell, 0.8 mile southeast of intersection of VA-16 and VA-601, 0.33 mile north of county line, 32 yards from VA-16 on Little Brushy Mountain, latitude of 37 degrees, 0 minutes, 21 seconds N. and longitude of 81 degrees, 31 minutes, 8 seconds W., in Tazewell South in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; partly decomposed and undecomposed leaves and twigs.

Ap—0 to 6 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and common medium roots; many very fine tubular pores; 20 percent shale channers; strongly acid; clear smooth boundary.

Bw1—6 to 14 inches; yellowish brown (10YR 5/8) very channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine and common coarse roots between structural units; many very fine tubular pores; 45 percent shale and fine grained sandstone channers; very strongly acid; clear wavy boundary.

Bw2—14 to 24 inches; yellowish brown (10YR 5/8) extremely channery silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and common medium roots between structural units; many very fine vesicular pores; 60 percent shale and fine grained sandstone channers; very strongly acid; clear wavy boundary.

C—24 to 33 inches; yellowish brown (10YR 5/8) extremely channery silt loam; weak fine granular structure; friable, slightly sticky and nonplastic; few very fine roots between structural units; many very fine vesicular pores; 65 percent shale channers; very strongly acid.

R—33 inches; weathered shale.

Range in Characteristics

Solum thickness: 15 to 35 inches

Depth to bedrock: 20 to 40 inches

Rock fragment content: Shale, siltstone, or fine grained sandstone fragments; 15 to 35 percent in the A or Ap horizon, 35 to 65 percent in the Bw horizon, and 50 to 80 percent in the C horizon

Reaction: Very strongly acid or strongly acid in A or Ap horizon; extremely acid to strongly acid in Bw and C horizons

A or Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture—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:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam or silt loam in the fine earth fraction

Bland Series

Depth class: Moderately deep
Permeability: Moderately slow
Drainage class: Well drained
Physiographic province: Valley and Ridge
Landform: Hills and spurs
Parent material: Argillaceous limestone
Slope range: 2 to 50 percent

Associated Soils

- Areas of Berks soils, which formed in residuum derived from shale, are yellower than Bland soils, have less clay and more rock fragments than Bland soils, and are on ridges and spur ridges on landscapes higher than those of Bland soils
- Areas of Carbo soils, which have more clay than Bland soils, are yellower than Bland soils, and are on landscapes similar to or lower than those of Bland soils
- Areas of very deep Murrill soils, which formed in colluvium derived from sandstone and shale and are generally on spur ridges on landscapes lower than those of Bland soils
- Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone, siltstone, and shale, have more rock fragments than Bland soils, and are on ridges and spur ridges on landscapes higher than those of Bland soils, and in drainageways
- Areas of very deep Poplimento soils, which formed in residuum derived from shale, are yellower than Bland soils, and are on landscapes higher than those of Bland soils
- Areas of deep Westmoreland soils, which formed in residuum derived from shale, are yellower than Bland soils, and are on landscapes higher than those of Bland soils

Typical Pedon

Bland silty clay loam, in an area of Bland-Rock outcrop complex, 25 to 50 percent slopes, about 2.3 miles southwest of Tazewell, 1.5 miles south-southeast of intersection of U.S. 460 and VA-16, 500 yards northwest of intersection of VA-16 and VA-604, latitude of 37 degrees, 4 minutes, 49 seconds N. and longitude of 81 degrees, 33 minutes, 9 seconds W., in Tazewell South in the Virginia Quadrangle; in pasture:

Ap—0 to 4 inches; reddish gray (5YR 5/2) silty clay loam; weak fine and medium granular structure; friable, slightly sticky and slightly plastic; many fine roots; many very fine tubular pores; 2 percent shale and limestone channers; strongly acid; abrupt smooth boundary.
BE—4 to 7 inches; reddish brown (5YR 4/3) silty clay; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; many fine roots; common fine tubular pores; 2 percent shale and limestone channers; strongly acid; clear smooth boundary.
Bt1—7 to 18 inches; reddish brown (5YR 4/3) silty clay; strong coarse subangular blocky structure; hard and slightly firm, slightly sticky and slightly plastic; common fine roots; common fine and medium tubular pores; few distinct clay films on faces of peds; moderately acid; gradual smooth boundary.
Bt2—18 to 30 inches; weak red (2.5YR 4/2) silty clay; strong medium and coarse subangular blocky structure; hard and firm, sticky and plastic; few fine roots; common fine tubular pores; common prominent clay films on faces of peds; few medium distinct yellowish red (5YR 5/6) streaks and soft masses of highly weathered argillaceous limestone; slightly acid; gradual smooth boundary.
C—30 to 36 inches; dusky red (2.5YR 3/2) channery clay; massive; hard and firm, sticky and slightly plastic; 30 percent slightly weathered dusky red and dark reddish brown argillaceous limestone channers that can be broken with fingers; neutral; abrupt smooth boundary.
R—36 inches; hard, dusky red, argillaceous limestone.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Shale and limestone fragments; 0 to 15 percent in the Ap, E, BE, and Bt horizons and 15 to 50 percent in the C horizon
Reaction: Strongly acid to neutral

Ap horizon:
Hue—5YR
Value—3 to 5
Chroma—2 or 3
Texture—silty clay loam; Ap horizon less than 7 inches thick where moist value is less than 4

E horizon (where it occurs):
Hue—5YR

Value—3 to 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

BE horizon:
Hue—5YR
Value—3 to 5
Chroma—2 or 3
Texture—silty clay loam or silty clay

Bt horizon:
Hue—2.5YR or 5YR
Value—3 or 4; higher value allowed in the lower part of the Bt horizon
Chroma—2 or 3; higher chroma allowed in the lower part of the Bt horizon
Texture—silty clay or clay with 45 to 60 percent clay and 4 to 8 percent sand

C horizon:
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

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Terrace treads and risers
Parent material: Alluvium derived from limestone, shale, quartzite, and sandstone
Slope Range: 7 to 15 percent

Associated Soils

• Areas of Wolfgap soils, which formed in recent alluvium, have a thick, dark surface layer, and are on the lower flood plains

Typical Pedon

Botetourt loam, 7 to 15 percent slopes, about 0.1 mile southeast of intersection of VA-42 and VA-621, 0.25 mile east of Goodwill Church, and 0.5 mile south-southwest of Young Chapel, latitude of 37 degrees, 57 minutes, 38.1 seconds N. and longitude of 81 degrees, 28 minutes, 14.9 seconds W; in cropland:

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) loam; moderate medium granular structure; friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine vesicular and tubular pores; slightly acid; abrupt smooth boundary.
BA—7 to 18 inches; yellowish brown (10YR 5/8) loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; many very fine and fine roots; common fine vesicular and tubular pores; slightly acid; clear smooth boundary.
Bt1—18 to 37 inches; yellowish brown (10YR 5/8) clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine vesicular and tubular pores; common faint clay films on faces of peds; common medium distinct light gray (10YR 6/1) iron depletions; moderately acid; clear smooth boundary.
Bt2—37 to 48 inches; yellowish brown (10YR 5/8) gravelly loam; moderate medium subangular blocky structure; friable, slightly sticky and nonplastic; few fine roots; common fine vesicular and tubular pores; few faint clay bridges and films on sand grains; 20 percent gravel; common medium distinct light gray (10YR 7/1) iron depletions; strongly acid; clear smooth boundary.
C—48 to 62 inches; yellowish brown (10YR 5/6) gravelly loam; massive; friable, nonsticky and nonplastic; few fine vesicular and tubular pores; 25 percent gravel; many medium distinct light gray (10YR 7/1) iron depletions; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragment content: Rounded gravel and cobbles; 0 to 15 percent in the Ap horizon; 0 to 35 percent in the BA, Bt, and BC horizons; and 5 to 50 percent in the C horizon
Reaction: Strongly acid to slightly acid, unless limed

Ap horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—loam

BA horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—loam, silt loam, sandy clay loam, or clay loam in the fine earth fraction

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:
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—5YR to 2.5Y
Value—4 to 6
Chroma—1 to 8
Texture—sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam in the fine earth fraction.

Brushy Series

Depth class: Moderately deep
Permeability: Moderate
Drainage class: Well drained
Physiographic province: Valley and Ridge
Landform: Hills and spurs
Parent material: Cherty limestone
Slope range: 7 to 60 percent

Associated Soils

• Areas of Berks soils, which formed in residuum derived from shale, have shale fragments, and are on ridges and spur ridges on landscapes similar to or higher than those of Brushy soils
• Areas of Lily soils, which formed in residuum derived from sandstone, have fewer rock fragments than Brushy soils, and are on ridges and spur ridges on landscapes higher than those of Brushy soils
• Areas of shallow Weikert soils, which formed in residuum derived from shale, have shale fragments, and are on ridges and spur ridges on landscapes similar to or higher than those of Brushy soils

Typical Pedon

Brushy gravelly loam, in an area of Brushy gravelly loam, 25 to 60 percent slopes, about 10.25 miles southwest of Tazewell, 1.5 miles northeast of intersection of VA-601 and VA-607, 0.3 mile north of VA-601 in Freestone Valley, latitude of 36 degrees, 59 minutes, 25 seconds N. and longitude of 81 degrees, 36 minutes, 40 seconds W., in Chatham Hill in the Virginia Quadrangle; in woodland:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) gravelly loam; weak fine granular structure; friable, nonsticky and nonplastic; common very fine roots; many fine and very fine vesicular and tubular pores; 25 percent chert gravel; strongly acid; clear smooth boundary.
BA—4 to 10 inches; dark yellowish brown (10YR 4/6) very gravelly loam; weak fine granular structure; friable, slightly sticky and nonplastic; few fine and medium roots; many very fine and fine vesicular and tubular pores; 40 percent chert gravel; strongly acid; clear wavy boundary.
Bt—10 to 23 inches; yellowish brown (10YR 5/4) very gravelly loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine to coarse roots; many fine vesicular and tubular pores; few faint patchy clay films on faces of peds; 40 percent chert gravel; very strongly acid; gradual wavy boundary.
R—23 inches; cherty limestone.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Chert and limestone fragments; 10 to 80 percent in individual subhorizons of the A, E, BA, and Bt horizons; on average, more than 35 percent between depths of 10 to 40 inches
Reaction: Extremely acid to moderately acid

A or Ap Horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—loam in the fine earth fraction

E horizon (where it occurs):
Hue—10YR
Value—6
Chroma—3 or 4
Texture—loam, silt loam, or fine sandy loam in the fine earth fraction

BA Horizon:
Hue—10YR
Value—4 or 5
Chroma—6 or 8
Texture—loam, silt loam, or fine sandy loam in the fine earth fraction

Bt Horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, clay loam, or sandy clay loam in the fine earth fraction

Calvin Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Physiographic province: Valley and Ridge
Landform: Ridges

Parent material: Acid, red shale interbedded with fine grained sandstone, mudrock, and siltstone
Slope range: 15 to 65 percent

Associated Soils

• Areas of Berks soils, which formed in shale yellower than that in which Calvin soils formed and are on ridges and spur ridges on landscapes lower than those of Calvin soils
• Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone and shale and are on ridges and spur ridges on landscapes similar to or lower than those of Calvin soils, and in drainageways
• Areas of very deep Poplimento soils, which formed in shale that is yellower than that in which Calvin soils formed and that is interbedded with limestone, have more clay and fewer rock fragments than Calvin soils, and are on hills and spur ridges on landscapes lower than those of Calvin soils
• Areas of Wallen soils, which formed in residuum derived from sandstone, are yellower than Calvin soils, have more sand and less silt than Calvin soils, and are on ridges on landscapes higher than those of Calvin soils
• Areas of deep Westmoreland soils, which formed in shale that is yellower than that in which Calvin soils formed and that is interbedded with limestone, have fewer rock fragments than Calvin soils, and are on hills and spur ridges on landscapes lower than those of Calvin soils

Typical Pedon

Calvin channery silt loam, 35 to 55 percent slopes, about 4.75 miles south of Tazewell, 1.5 miles east-southeast of intersection of VA-16 and VA-602, 0.4 mile east-northeast of VA-16 on Clinch Mountain, latitude of 37 degrees, 2 minutes, 59 seconds N. and longitude of 81 degrees, 30 minutes, 18 seconds W., in Tazewell South in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; partly decomposed and undecomposed leaves and twigs.
Ap—0 to 8 inches; reddish brown (5YR 4/3) channery silt loam; weak fine granular structure; friable; many very fine and few coarse roots; many very fine pores; 20 percent shale channers; strongly acid; clear smooth boundary.
Bw—8 to 25 inches; reddish brown (5YR 4/4) very channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine and few medium roots; many very fine pores; 50 percent shale channers; very strongly acid; clear wavy boundary.
C—25 to 32 inches; reddish brown (5YR 4/4) extremely channery silt loam; weak fine granular structure; friable; few very fine roots; many very fine pores; 65 percent shale channers; very strongly acid.
R—32 inches; unweathered shale.

Range in Characteristics

Solum thickness: 20 to 30 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Shale, siltstone, fine grained sandstone, or mudrock channers or flags; 10 to 25 percent in the A or Ap horizon, 35 to 55 percent in the Bw horizon, and 40 to 80 percent in the C horizon
Reaction: Very strongly acid or strongly acid throughout

A or Ap horizon:
Hue—7.5YR or 5YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam in the fine earth fraction

Bw horizon:
Hue—5YR or 2.5YR
Value—4 or 5
Chroma—2 to 6
Texture—loam or silt loam in the fine earth fraction

C horizon:
Hue—5YR or 2.5YR
Value—3 to 5
Chroma—2 to 4
Texture—loam or silt loam in the fine earth fraction

Carbo Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Physiographic province: Valley and Ridge
Landform: Hills and spurs
Parent material: Limestone
Slope range: 7 to 65 percent

Associated Soils

• Areas of very deep Allegheny soils, which are on terraces and have less clay than Carbo soils
• Areas of Bland soils, which are redder than Carbo soils, have less clay than Carbo soils, and are on landscapes similar to or higher than those of Carbo soils
• Areas of shallow Chiswell soils, which formed in residuum derived from shale, have less clay, more rock fragments, and fewer rock outcrops than Carbo soils, and are on landscapes similar to or higher than those of Carbo soils
• Areas of very deep Frederick soils, which have fewer

rock outcrops than Carbo soils and are on hills on landscapes similar to or lower than those of Carbo soils
• Areas of very deep Groseclose soils, which have fewer rock outcrops than Carbo soils and are on landscapes similar to those of Carbo soils
• Areas of Litz soils, which formed in residuum derived from shale, have less clay, more rock fragments, and fewer rock outcrops than Carbo soils, and are on landscapes similar to or higher than those of Carbo soils
• Areas of very deep Murrill soils that formed in colluvium, that have less clay than that in Carbo soils, and that are on ridges and spur ridges on landscapes higher than those of Carbo soils
• Areas of shallow Newbern soils, which have less clay than Carbo soils and are on escarpments on landscapes lower than those of Carbo soils
• Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone and shale, have sandstone fragments, and are on ridges and spur ridges on landscapes higher than those of Carbo soils, and in drainageways
• Areas of deep Pisgah soils, which have less clay and fewer rock outcrops than Carbo soils and are on landscapes similar to those of Carbo soils
• Areas of very deep Timberville soils, which formed in colluvium and alluvium, have less clay than Carbo soils, and are in drainageways on landscapes lower than those of Carbo soils

Typical Pedon

Carbo silt loam, in an area of Carbo-Rock outcrop complex, 25 to 65 percent slopes, about 1.5 miles south of Tazewell, 0.33 mile northeast of intersection of VA-16 and VA-604, 2 miles southeast of U.S. 19 and 460, latitude of 37 degrees, 4 minutes, 57 seconds N. and longitude of 81 degrees, 31 minutes, 26 seconds W., in Tazewell in the Virginia quadrangle;
in pasture:

A—0 to 5 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable, slightly sticky and nonplastic; many very fine roots; many very fine pores; 3 percent limestone channers; neutral; clear smooth boundary.
BA—5 to 12 inches; strong brown (7.5YR 5/6) silty clay loam; weak fine and medium subangular blocky structure; friable, sticky and slightly plastic; few very fine roots; many very fine pores; 2 percent channers; slightly acid; clear wavy boundary.
Bt1—12 to 25 inches; strong brown (7.5YR 5/6) clay; moderate medium subangular blocky structure; firm, very sticky and plastic; few very fine roots; many very fine pores; many faint clay films on faces of peds; 1 percent limestone channers; neutral; clear wavy boundary.
Bt2—25 to 34 inches; strong brown (7.5YR 4/6) clay; moderate medium subangular blocky structure; firm, very sticky and very plastic; few very fine roots; many very fine pores; many faint clay films on faces of peds; 2 percent limestone channers; neutral.
R—34 inches; limestone.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Limestone, quartz, and some shale fragments; 0 to 10 percent in the Ap and BA horizons and 0 to 15 percent in the B and C horizons
Reaction: Very strongly acid to neutral in the A horizon and moderately acid to neutral in the B horizon

A horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 6
Texture—silt loam; Ap horizon, where it occurs, less than 6 inches thick where both value and chroma are 3

BA horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—4 to 8
Texture—silt loam or silty clay loam

Bt horizon:
Hue—5YR to 10YR; hue of 5YR restricted to the lower part of the Bt horizon
Value—4 to 6; in some pedons, mottles and streaks of higher value
Chroma—4 to 8; in some pedons, mottles and streaks of higher chroma
Texture—clay

C horizon (where it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—silty clay or clay

R horizon:
Generally limestone; some interbedded limestone and shale

Cedarcreek Series

Depth class: Very deep
Drainage class: Well drained

Permeability: Moderately rapid
Physiographic province: Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Ridges and spurs
Parent material: Mine spoil from sandstone, siltstone, shale, and coal
Slope range: 0 to 80 percent

Associated Soils

• Areas of moderately deep Alticrest soils, which formed in residuum derived from sandstone, have more sand and fewer rock fragments than Cedarcreek soils, and are on summits and shoulders on landscapes similar to or higher than those of Cedarcreek soils
• Areas of moderately deep Berks soils, which formed in residuum derived from shale and are on summits, shoulders, and nose slopes on landscapes similar to or higher than those of Cedarcreek soils
• Areas of moderately deep Gilpin soils, which formed in residuum derived from shale, have fewer rock fragments than Cedarcreek soils, and are on summits, shoulders, and nose slopes on landscapes similar to or higher than those of Cedarcreek soils
• Areas of deep Grimsley soils, which formed in colluvium derived from sandstone and shale and are on ridges and spur ridges on landscapes similar to or higher than those of Cedarcreek soils, and in drainageways
• Areas of moderately deep Lily soils, which formed in residuum derived from sandstone, have fewer rock fragments than Cedarcreek soils, and are on summits and shoulders on landscapes higher than those of Cedarcreek soils

Typical Pedon

Cedarcreek very stony loam, in an area of Cedarcreek-Rock outcrop complex, 35 to 80 percent slopes, very stony, about 1.4 miles west-northwest of Richlands, 300 feet east of coal haul road, 6,000 feet north of where Mudlick Creek passes under U.S. 460 in Doran, latitude of 37 degrees, 6 minutes, 15.6 seconds N. and longitude of 81 degrees, 50 minutes, 16.8 seconds W., in Richlands in the Virginia Quadrangle; in woodland:

A—0 to 4 inches; very dark grayish brown (10YR 3/2) very stony loam; moderate fine granular structure; friable, nonsticky and nonplastic; common fine and medium roots; common fine vesicular and tubular pores; 30 percent sandstone stones, 15 percent shale channers, 20 percent siltstone channers, 2 percent coal gravel; strongly acid; clear smooth boundary.
C1—4 to 26 inches; dark yellowish brown (10YR 4/4) and dark grayish brown (10YR 4/2) extremely stony loam; massive; friable, nonsticky and nonplastic; few fine and medium roots; common fine vesicular and tubular pores; 30 percent sandstone stones, 20 percent shale channers, 20 percent siltstone channers, 5 percent coal gravel; very strongly acid; gradual smooth boundary.
C2—26 to 58 inches; yellowish brown (10YR 5/4) extremely stony loam; massive; friable, nonsticky and nonplastic; few fine roots; common fine vesicular and tubular pores; 30 percent sandstone stones, 15 percent shale channers, 15 percent siltstone channers, 2 percent coal gravel; very strongly acid; abrupt smooth boundary.
C3—58 to 72 inches; dark grayish brown (10YR 4/2) very gravelly loam; massive; friable, nonsticky and nonplastic; few fine roots; common fine vesicular and tubular pores; 10 percent sandstone channers, 10 percent shale channers, 5 percent siltstone channers, 15 percent coal gravel; very strongly acid; abrupt smooth boundary.

Range in Characteristics

Depth to bedrock: More than 60 inches
Rock fragment content: 15 to 80 percent throughout the profile; on average, more than 35 percent in the particle-size control section; sandstone, siltstone, shale, and coal fragments; each less than 65 percent of total rock fragments in the control section
Reaction: Strongly acid to extremely acid throughout except for surface layers that have been limed

A horizon:
Hue—7.5YR to 5Y or neutral
Value—2 to 5
Chroma—0 to 6
Texture—loam in the fine earth fraction

C horizon:
Hue—7.5YR to 5Y or neutral
Value—2 to 6
Chroma—0 to 8
Texture—in the fine earth fraction, loam, silt loam, or sandy loam

Chiswell Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Hills
Parent material: Shale interbedded with fine grained sandstone and siltstone and scattered limestone
Slope range: 15 to 60 percent

Associated Soils

• Areas of moderately deep Carbo soils, which formed in limestone residuum, have more clay, fewer rock fragments, and more rock outcrops than Chiswell soils, and are on landscapes similar to or lower than those of Cedarcreek soils
• Areas of very deep Groseclose soils, which formed in the predominantly limestone part of the parent material, have more clay and fewer rock fragments than Cedarcreek soils, and are on landscapes similar to or lower than those of Cedarcreek soils
• Areas of moderately deep Litz soils on landscapes similar to those of Chiswell soils

Typical Pedon

Chiswell silt loam, in an area of Chiswell-Litz complex, 35 to 60 percent slopes, about 1.6 miles east-northeast of Tazewell, 4.25 miles south of McDowell County, West Virginia, line, 1,000 feet north of VA-631, latitude of 37 degrees, 8 minutes, 36 seconds N. and longitude of 81 degrees, 34 minutes, 49 seconds W., in Tazewell North in the Virginia Quadrangle; in pasture:

A—0 to 2 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine and very fine roots; many very fine vesicular and tubular pores; 10 percent shale channers; slightly acid; clear smooth boundary.
BA—2 to 11 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine vesicular and tubular pores; 20 percent shale channers; moderately acid; clear wavy boundary.
Bw—11 to 14 inches; yellowish brown (10YR 5/6) very channery silt loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular and tubular pores; 40 percent shale channers; strongly acid; gradual wavy boundary.
C—14 to 17 inches; yellowish brown (10YR 5/6) extremely channery silt loam; weak fine granular structure; friable, slightly sticky and nonplastic; many very fine and fine vesicular and tubular pores; 60 percent shale channers; very strongly acid; clear wavy boundary.
Cr—17 to 20 inches; light olive brown (2.5Y 5/6) weathered shale; clear wavy boundary.
R—20 inches; shale.

Range in Characteristics

Solum thickness: 5 to 19 inches
Depth to bedrock: 10 to 20 inches
Rock fragment content: Shale, siltstone, or fine grained sandstone fragments; 5 to 70 percent in the A or Ap horizon, 20 to 80 percent in the Bw horizon, and 45 to 90 percent in the C horizon
Reaction: Extremely acid to moderately acid, unless limed

A or Ap horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 5
Texture—silt loam

BA horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 6
Texture—silt loam or loam in the fine earth fraction

Bw horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, loam, silty clay loam, or clay loam in the fine earth fraction

C horizon:
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—silt loam, loam, silty clay loam, or clay loam in the fine earth fraction

Coursey Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately slow
Physiographic province: Valley and Ridge
Landform: Terrace treads and risers
Parent material: Loamy alluvium
Slope range: 2 to 7 percent

Associated Soils

• Areas of well drained Allegheny soils on terraces on landscapes similar to or higher than those of Coursey soils
• Areas of Lindside soils, which are on flood plains and have more silt and less sand than Coursey soils
• Areas of somewhat poorly drained Newark soils, which are on flood plains and have more silt and less sand than Coursey soils
• Areas of well drained Pope soils, which are on flood plains and have less clay and more sand than Coursey soils

• Areas of poorly drained Purdy soils, which have more clay than Coursey soils and are on landscapes similar to or lower than those of Coursey soils

Typical Pedon

Coursey loam, 2 to 7 percent slopes, about 1 mile east-southeast of Richlands, 0.25 mile west-southwest of Cedar Bluff, about 700 feet southeast of U.S. 460 and Business U.S. 460 in Cedar Bluff, latitude of 37 degrees, 5 minutes, 11.5 seconds N. and longitude of 81 degrees, 46 minutes, 1.4 seconds W, in Richlands in the Virginia Quadrangle; in pasture:

Ap—0 to 8 inches; very dark brown (10YR 3/2) loam; moderate fine granular structure; friable, nonsticky and nonplastic; many very fine roots; many fine vesicular and tubular pores; neutral; abrupt smooth boundary.

BA—8 to 13 inches; light yellowish brown (10YR 6/4) loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; common fine vesicular and tubular pores; neutral; clear wavy boundary.

Bt1—13 to 26 inches; brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine vesicular and tubular pores; few patchy faint clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—26 to 40 inches; brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine vesicular and tubular pores; common fine and medium prominent light brownish gray (10YR 6/2) iron depletions; common distinct discontinuous clay films on faces of peds; common fine and medium distinct strong brown (7.5YR 5/6) accumulations of soft iron masses; moderately acid; clear wavy boundary.

Bt3—40 to 53 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine vesicular and tubular pores; many medium prominent light brownish gray (10YR 6/2) iron depletions; common discontinuous distinct clay films on faces of peds; few medium distinct strong brown (7.5YR 5/8) accumulations of soft iron masses; strongly acid; gradual wavy boundary.

Bt4—53 to 60 inches; yellowish brown (10YR 5/6) and brown (10YR 5/3) sandy clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine vesicular and tubular pores; many medium prominent light brownish gray (10YR 6/2) iron depletions; few discontinuous faint clay films on faces of peds; few fine distinct strong brown (7.5YR 5/8) accumulations of soft iron masses; 5 percent sandstone gravel; very strongly acid; gradual wavy boundary.

Btg—60 to 65 inches; light brownish gray (10YR 6/2) sandy clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine vesicular and tubular pores; few discontinuous faint clay films on faces of peds; many coarse prominent yellowish brown (10YR 5/6) and many medium prominent strong brown (7.5YR 5/6) accumulations of soft iron masses; 5 percent sandstone gravel; very strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragment content: Gravel and cobbles; 0 to 35 percent in the A and Bt horizons and 0 to 50 percent in the BC and C horizons
Reaction: Extremely acid to strongly acid throughout, unless limed

A horizon (where it occurs):
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—loam

Ap horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—loam in the fine earth fraction

BA horizon:
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—loam in the fine earth fraction

Bt horizon:
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—loam, clay loam, or sandy clay loam in the fine earth fraction

Btg horizon:
Hue—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

BC horizon (where it occurs):
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—3 to 8
Texture—loam, clay loam, or sandy clay loam in the fine earth fraction

C horizon (where it occurs):
Hue—7.5YR to 2.5Y or neutral
Value—4 to 8
Chroma—0 to 8
Texture—loam, sandy clay loam, or clay loam in the fine earth fraction

Craigsville Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid or rapid
Physiographic provinces: Valley and Ridge and Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Flood plains
Parent material: Alluvium derived from shale, siltstone, and sandstone
Slope range: 0 to 5 percent

Associated Soils

• Areas of moderately well drained Philo soils, which are deep to bedrock, have fewer rock fragments than Craigsville soils, and are on landscapes similar to those of Craigsville soils
• Areas of Pope soils, which are subject to rare flooding, have fewer rock fragments than Craigsville soils, and are on flood plains similar to or higher than those of Craigsville soils

Typical Pedon

Craigsville very gravelly sandy loam, 0 to 5 percent slopes, frequently flooded, about 5 miles south-southeast of Tazewell, 2.2 miles east of intersection of VA-16 and Forest Service Road 222, 50 feet north of Roaring Fork, latitude of 37 degrees, 2 minutes, 6 seconds N. and longitude of 81 degrees, 28 minutes, 50 seconds W., in Hutchinson Rock in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; partly decomposed and undecomposed leaves and twigs.
A—0 to 7 inches; dark brown (10YR 3/3) very gravelly sandy loam; weak fine granular structure; very friable; many coarse roots; many very fine pores; 40 percent sandstone gravel; very strongly acid; clear smooth boundary.
Bw1—7 to 23 inches; brown (7.5YR 4/4) very cobbly sandy loam; weak medium subangular blocky structure; very friable; many medium roots; many very fine pores; 30 percent sandstone cobbles and 20 sandstone gravel; very strongly acid; clear wavy boundary.
Bw2—23 to 35 inches; reddish brown (5YR 4/4) extremely cobbly sandy loam; weak medium subangular blocky structure; very friable; common fine roots; many very fine pores; 10 percent sandstone stones, 40 percent sandstone cobbles, 15 percent sandstone gravel; very strongly acid; clear wavy boundary.
C—35 to 61 inches; reddish brown (5YR 4/4) extremely stony loamy sand; single grain; loose; few fine roots; many very fine pores; 40 percent sandstone stones, 15 percent sandstone cobbles, 10 percent sandstone gravel; very strongly acid.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: More than 60 inches
Reaction: Very strongly acid or strongly acid throughout
Rock fragment content: 35 to 60 percent in the A horizon and 35 to 70 percent in the Bw and C horizons

A horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—2 to 4
Texture—sandy loam in the fine earth fraction

Bw horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—4 or 6
Texture—loam or sandy loam in the fine earth fraction

C horizon:
Hue—5YR to 10YR
Value—4 or 5
Chroma—3 to 6
Texture—loamy sand or sandy loam in the fine earth fraction

Drypond Series

Depth class: Shallow
Drainage class: Excessively drained
Permeability: Rapid
Physiographic province: Valley and Ridge
Landform: Mountains
Parent material: Sandstone and quartzite
Slope range: 15 to 80 percent

Associated Soils

• Areas of Calvin soils, which are deeper and redder than Drypond soils, have more silt and less sand than Drypond soils, formed in residuum derived from shale and sandstone, and are on landscapes lower than those of Drypond soils
• Areas of Lily soils, which are deeper than Drypond soils, have fewer rock fragments than Drypond soils, and are on landscapes similar to or lower than those of Drypond soils
• Areas of Wallen soils, which are deeper than Drypond soils and are on landscapes similar to those of Drypond soils

Typical Pedon

A typical profile of Drypond very gravelly sandy loam, in an area of Drypond-Rock outcrop complex, 35 to 80 percent slopes, extremely stony, about 1.5 miles northwest of junction of Highways VA-16 and VA-348, 0.5 mile north of Stone Lick Hollow, and 2.0 miles southeast of Big Cave, latitude of 36 degrees, 53 minutes, 19.6 seconds N and longitude of 81 degrees, 33 minutes, 5.3 seconds W; in woodland:

Oi—2 inches to 0; partly decomposed and undecomposed leaves and twigs.
A—0 to 3 inches; brown (10YR 4/3) very gravelly sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine vesicular and tubular pores; 40 percent gravel; extremely acid; abrupt wavy boundary.
Bw—3 to 11 inches; yellowish brown (10YR 5/8) very gravelly sandy loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine vesicular and tubular pores; 45 percent gravel; very strongly acid; gradual wavy boundary.
C—11 to 16 inches; yellowish brown (10YR 5/8) extremely gravelly sandy loam; massive; friable, slightly sticky and nonplastic; few very fine roots; many fine vesicular and tubular pores; 70 percent gravel; very strongly acid; clear wavy boundary.
R—16 inches; hard quartzite.

Range in Characteristics

Solum thickness: 10 to 20 inches
Depth to bedrock: 10 to 20 inches
Rock fragment content: Gravel and channers; 35 to 65 percent in the A horizon, 25 to 80 percent in the Bw 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—sandy 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

Frederick Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Hills
Parent material: Dolomitic limestone interbedded with sandstone and shale
Slope range: 2 to 60 percent

Associated Soils

• Areas of Allegheny soils, which formed in alluvium derived from sandstone, shale, and limestone, have less clay than Frederick soils, and are on terraces on landscapes lower than those of Frederick soils
• Areas of moderately deep Carbo soils, which have more rock outcrops than Frederick soils and are on hills and spur ridges on landscapes similar to or higher than those of Frederick soils
• Areas of Murrill soils, which formed in colluvium derived from sandstone and shale, have less clay at shallow depths than Frederick soils, and are on foot slopes and toe slopes on ridges and spur ridges on landscapes similar to or higher than those of Frederick soils
• Areas of shallow Newbern soils, which have less clay than Frederick soils, are in a complex with rock outcrops, and are on escarpments on landscapes steeper than those of Frederick soils
• Areas of Oriskany soils, which formed in colluvium derived from sandstone, siltstone, and shale, have more rock fragments and less clay than Frederick soils, and are on back slopes, foot slopes, toe slopes on landscapes higher than those of Frederick soils, and in drainageways
• Areas of Timberville soils, which formed in alluvium

and colluvium derived from surrounding uplands, are subject to flooding by runoff, and are in drainageways and depressions on landscapes lower than those of Frederick soils

Typical Pedon

Frederick silt loam, 7 to 15 percent slopes, about 3 miles south-southwest of Tazewell, 0.5 mile northwest of intersection of VA-16 and VA-602, 2.75 miles south-southeast of intersection of VA-16 and U.S. 19 and 460, latitude of 37 degrees, 3 minutes, 38 seconds N. and longitude of 81 degrees, 32 minutes, 12 seconds W., in Tazewell South in the Virginia Quadrangle; in cropland:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable; many very fine roots; many very fine pores; 3 percent chert gravel; neutral; clear smooth boundary.

BA—8 to 14 inches; strong brown (7.5YR 5/8) silty clay loam; weak fine subangular blocky structure; friable; few very fine roots; many very fine pores; 12 percent chert gravel; neutral; clear wavy boundary.

Bt1—14 to 27 inches; yellowish red (5YR 5/8) silty clay; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; common very fine pores; few faint clay films on faces of peds; few fine faint red (2.5YR 4/8) soft masses of highly weathered chert; 1 percent chert gravel; neutral; clear wavy boundary.

Bt2—27 to 34 inches; yellowish red (5YR 5/8) clay; moderate fine and medium subangular blocky structure; firm, sticky and slightly plastic; many very fine pores; common distinct clay films on faces of peds; common medium faint red (2.5YR 4/8) and common medium distinct brownish yellow (10YR 6/8) soft masses of highly weathered chert; 5 percent chert gravel; moderately acid; clear wavy boundary.

Bt3—34 to 50 inches; yellowish red (5YR 5/8) clay; moderate fine and medium subangular blocky structure; firm, sticky and plastic; many very fine pores; common distinct clay films on faces of peds; few fine faint red (2.5YR 4/8) and few fine distinct brownish yellow (10YR 6/8) soft masses of highly weathered chert; 1 percent chert gravel; very strongly acid; clear wavy boundary.

Bt4—50 to 62 inches; yellowish red (5YR 5/8) silty clay; moderate fine and medium subangular blocky structure; firm, sticky and slightly plastic; many fine pores; few distinct clay films on faces of peds; 2 percent faint red (2.5YR 4/8) and 2 percent distinct brownish yellow (10YR 6/8) soft masses of highly weathered chert; 10 percent chert gravel; very strongly acid.

Range in Characteristics

Solum thickness: 60 inches or more
Depth to bedrock: More than 72 inches
Rock fragment content: Siltstone, shale, and sandstone fragments, but mostly chert gravel; 0 to 35 percent in the A and E horizons and 0 to 15 percent in the Bt, BC, and C horizons
Reaction: Very strongly acid to moderately acid throughout, unless limed

Ap horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 or 6
Texture—silt loam

E horizon (where it occurs):
Hue—7.5YR or 10YR
Value—5 to 7
Chroma—3 to 8
Texture—loam or silt loam

BA or BE horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silt loam or silty clay loam

Bt horizon:
Hue—2.5YR or 5YR
Value—4 to 6
Chroma—4 to 8
Texture—silty clay loam, silty clay, or clay loam in upper part and silty clay or clay in lower part

BC horizon (where it occurs):
Hue—2.5YR to 10YR
Value—3 to 6
Chroma—4 to 8
Texture—silty clay or clay

C horizon (where it occurs):
Hue—5YR
Value—4 to 7
Chroma—6 or 8
Texture—silty clay or clay

Gilpin Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Appalachian Plateaus,

Cumberland Plateau and Cumberland Mountain section
Landform: Ridges and spurs
Parent material: Noncalcareous shale
Slope range: 7 to 70 percent

Associated Soils

- Areas of Berks soils, which have more shale fragments and less clay than Gilpin soils and are on landscapes similar to those of Gilpin soils
- Areas of very deep Cedarcreek soils, which formed in regolith from surface mining operations, have more rock fragments than Gilpin soils, and are on shoulders, back slopes, foot slopes, and toe slopes on landscapes similar to or lower than those of Gilpin soils
- Areas of deep Grimsley soils, which are in drainageways, formed in colluvium derived from sandstone and shale, and are on landscapes similar to or lower than those of Gilpin soils

Typical Pedon

Gilpin silt loam, in an area of Berks-Gilpin complex, 35 to 70 percent slopes, about 5 miles north-northeast of Richlands, 2.7 miles south of intersection of VA-616 and VA-621 in Jewell Ridge on VA 621, 2,000 feet to the east, latitude of 37 degrees, 10 minutes, 11.7 seconds N. and longitude of 81 degrees, 45 minutes, 47.6 seconds W., in Jewell Ridge in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; undecomposed hardwood leaf litter and twigs; abrupt smooth boundary.
A—0 to 2 inches; dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; many fine and medium vesicular and tubular pores; 5 percent shale channers; very strongly acid; clear smooth boundary.
BE—2 to 6 inches; yellowish brown (10YR 5/5) silt loam; moderate fine subangular blocky structure; friable, nonsticky and nonplastic; common fine and medium roots; common fine vesicular and tubular pores; 5 percent shale channers; very strongly acid; clear wavy boundary.
Bt1—6 to 18 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable, slightly sticky and plastic; common fine and medium roots; common fine and few medium vesicular and tubular pores; common continuous distinct (7.5YR 5/4) clay films on faces of peds; 5 percent shale channers; strongly acid; gradual wavy boundary.
Bt2—18 to 30 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable, slightly sticky and plastic; common fine and medium roots; common fine vesicular and tubular pores; common continuous distinct (7.5YR 5/4) clay films on faces of peds; 10 percent shale channers; strongly acid; gradual wavy boundary.
C—30 to 35 inches; yellowish brown (10YR 5/6) very channery silt loam; weak medium subangular blocky structure; firm, nonsticky and nonplastic; few fine roots; common fine vesicular and tubular pores; few patchy faint clay films on faces of peds and on rock fragments; 75 percent shale channers; very strongly acid; clear wavy boundary.
R—35 inches; weathered shale.

Range in Characteristics

Solum thickness: 18 to 36 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Shale, siltstone, or sandstone channers; 5 to 35 in the solum and 30 to 90 percent in the C horizon
Reaction: Strongly acid to extremely acid throughout unless limed

A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam in the fine earth fraction

E horizon (where it occurs):
Hue—10YR
Value—3 to 5
Chroma—2
Texture—silt loam or loam in the fine earth fraction

BE horizon:
Hue—7.5YR to 10YR
Value—4 to 6
Chroma—3 to 5
Texture—silt loam or loam

Bt horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—4 to 8
Texture—silt loam, loam, clay loam, or silty clay loam in the fine earth fraction

C horizon:
Hue—7.5YR to 2.5Y
Value—3 to 5
Chroma—2 to 6
Texture—silt loam, loam, or silty clay loam in the fine earth fraction

Grimsley Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderately rapid
Physiographic province: Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Ridges, spurs, and drainageways
Parent material: Colluvium derived from sandstone and shale
Slope range: 8 to 70 percent

Associated Soils

- Areas of moderately deep Alticrest soils, which formed in residuum derived from sandstone, have more sand and fewer rock fragments than Grimsley soils, and are on summits and shoulders on landscapes higher than those of Grimsley soils
- Areas of moderately deep Berks soils, which formed in residuum derived from shale, have shale fragments, and are on landscapes similar to or higher than those of Grimsley soils
- Areas of very deep Cedarcreek soils, which formed in regolith of surface mining operations and are on landscapes similar to or higher than those of Grimsley soils
- Areas of very deep Craigsville soils on flood plains
- Areas of moderately deep Gilpin soils, which formed in residuum derived from shale, have fewer rock fragments than Grimsley soils, and are on landscapes similar to or higher than those of Grimsley soils
- Areas of moderately deep Lily soils, which formed in residuum derived from sandstone, have fewer rock fragments than Grimsley soils, and are on summits and shoulders on landscapes higher than those of Grimsley soils
- Areas of moderately well Philo soils, which are on flood plains and have fewer rock fragments than those in Grimsley soils

Typical Pedon

Grimsley loam, 35 to 70 percent slopes, very stony, about 2.5 miles northeast of town of Richlands, 2.6 miles north on VA-67 from the intersection of VA-67 and U.S. 460 in Richlands, 2,300 feet east, latitude of 37 degrees, 7 minutes, 32.4 seconds N. and longitude of 81 degrees, 46 minutes, 28.2 seconds W., in Jewell Ridge in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; undecomposed hardwood leaves and twigs; abrupt smooth boundary.
A—0 to 2 inches; dark grayish brown (10YR 4/2) very channery loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine roots; many fine vesicular and tubular pores; 20 percent sandstone channers 1 to 3 inches across, 15 percent sandstone channers 3 to 5 inches across; strongly acid; clear smooth boundary.
E—2 to 10 inches; yellowish brown (10YR 5/4) channery loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; common fine vesicular and tubular pores; 25 percent sandstone channers 2 to 6 inches across; strongly acid; clear wavy boundary.
Bt1—10 to 24 inches; yellowish brown (10YR 5/4) very channery clay loam; moderate fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine vesicular and tubular pores; common continuous faint clay films on faces of peds and rock fragments; 40 percent sandstone channers 3 to 6 inches across; strongly acid; clear wavy boundary.
Bt2—24 to 48 inches; yellowish brown (10YR 5/4) very channery clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine vesicular and tubular pores; common continuous faint clay films on faces of peds and on rock fragments; 45 percent sandstone channers 3 to 6 inches across; strongly acid; gradual wavy boundary.
Bt3—48 to 60 inches; yellowish brown (10YR 5/4) very channery clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine vesicular and tubular pores; common continuous faint clay films on faces of peds and on rock fragments; 50 percent sandstone channers 3 to 6 inches across; strongly acid; abrupt wavy boundary.

Range in Characteristics

Solum thickness: 40 to 60 inches
Depth to bedrock: 40 to 60 inches
Rock fragment content: Sandstone and shale channers and stones; 15 to 50 percent in the A horizon and 35 to 65 percent in the B and C horizons
Reaction: Strongly acid or very strongly acid throughout

A horizon:
Hue—10YR
Value—3 or 4
Chroma—2
Texture—loam in the fine earth fraction

E horizon:
Hue—10YR
Value—4 to 6
Chroma—3 or 4

Texture—loam or sandy loam in the fine earth fraction

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, clay loam, or sandy clay loam and a weighted average of more than 20 percent clay in the fine earth fraction

BC or C horizon (where either occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, clay loam, sandy clay loam, or sandy loam in the fine earth fraction

Groseclose Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Physiographic Province: Valley and Ridge
Landform: Hills
Parent material: Limestone interbedded with shale, siltstone, and sandstone
Slope range: 2 to 35 percent

Associated Soils

- Areas of moderately deep Carbo soils, which have more rock outcrops than Groseclose soils and are on landscapes similar to those of the Groseclose soils
- Areas of shallow Chiswell soils, which formed mainly in shale, have less clay and more rock fragments than Groseclose soils, and are on landscapes similar to or higher than those of Groseclose soils
- Areas of moderately deep Litz soils, which formed mainly in shale, have less clay and more rock fragments than Groseclose soils, and are on landscapes similar to or higher than those of Groseclose soils

Typical Pedon

Groseclose silt loam, 2 to 7 percent slopes, about 1.5 miles north of Tazewell, 3.6 miles south-southeast of the McDowell County, West Virginia, line, 125 feet east of VA-16, latitude of 37 degrees, 9 minutes, 24 seconds N. and longitude of 81 degrees, 32 minutes, 22 seconds W., in Tazewell North in the Virginia Quadrangle; in a hayfield:

Ap—0 to 5 inches; dark yellowish brown (10YR 3/4) silt loam; weak fine granular structure; friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine vesicular and tubular pores; slightly acid; abrupt smooth boundary.
BA—5 to 11 inches; brown (7.5YR 4/4) silty clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular and tubular pores; moderately acid; clear wavy boundary.
Bt—11 to 52 inches; yellowish red (5YR 5/6) clay; moderate fine subangular blocky structure; firm, sticky and plastic; common very fine roots; common very fine vesicular and tubular pores; common faint continuous clay films on faces of peds; 1 percent chert gravel; strongly acid; clear wavy boundary.
CB—52 to 61 inches; yellowish red (5YR 5/8) silty clay loam; weak medium subangular blocky structure; friable, sticky and slightly plastic; few very fine roots; common very fine vesicular and tubular pores; very strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches
Depth to bedrock: More than 60 inches
Rock fragment content: Chert, siltstone, shale, and sandstone fragments; 0 to 35 percent throughout the profile
Reaction: Extremely acid to strongly acid, unless limed

Ap or A horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 8
Texture—silt loam

BA horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silt loam, loam, silty clay loam, or clay loam in the fine earth fraction

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—clay, silty clay, silty clay loam, or clay loam in the fine earth fraction

BC or CB horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—clay, silty clay, silty clay loam, clay loam, or sandy clay loam in the fine earth fraction

C horizon (where it occurs):

Hue—5YR to 10YR
Value—4 to 7
Chroma—4 to 8
Texture—silty clay loam, silt loam, clay loam, clay, sandy clay loam, or sandy loam in the fine earth fraction

Guernsey Series

Depth class: Deep or very deep
Drainage class: Moderately well drained
Permeability: Moderately slow or slow
Physiographic province: Valley and Ridge
Landform: Hills
Parent material: Residuum and colluvium derived from sandstone, siltstone, shale, and limestone
Slope range: 2 to 15 percent

Associated Soils

- Areas of Lindside soils, which are on flood plains and have more silt and less clay than Guernsey soils
- Areas of somewhat poorly drained Newark soils, which are on flood plains and have more silt and less clay than Guernsey soils
- Areas of well drained Pope soils, which are on flood plains and have more sand and less clay than Guernsey soils
- Areas of poorly drained Purdy soils, which are on landscapes similar to those of Guernsey soils and in depressions on landscapes lower than those of Guernsey soils

Typical Pedon

Guernsey silt loam, 2 to 7 percent slopes, 11 miles south-southwest of Tazewell, VA, 11 miles southeast of Richlands, 0.5 mile north-northeast of intersection of VA-607 and VA-675, 250 feet west of VA-675, latitude of 36 degrees, 59 minutes, 19 seconds N. and longitude of 81 degrees, 38 minutes, 4 seconds W., in Broadford in the Virginia Quadrangle; in cropland:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; common very fine roots; many very fine vesicular and tubular pores; 3 percent sandstone gravel; strongly acid; abrupt smooth boundary.
BE—10 to 21 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine vesicular and tubular pores; 8 percent sandstone gravel; strongly acid; clear wavy boundary.
Bt1—21 to 34 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; common very fine and fine vesicular and tubular pores; common faint clay films on faces of peds; common fine prominent light gray (10YR 7/2) iron depletions; 5 percent sandstone gravel; strongly acid; gradual wavy boundary.
Bt2—34 to 44 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; few fine vesicular and tubular pores; common faint clay films on faces of peds; many medium and coarse light gray (10YR 7/2) iron depletions; 5 percent sandstone gravel; strongly acid; gradual wavy boundary.
Bt3—44 to 56 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; few fine vesicular and tubular pores; common faint clay films on faces of peds; many medium distinct yellowish brown (10YR 5/6) accumulations of soft iron masses; 5 percent sandstone gravel; moderately acid; gradual wavy boundary.
2Cg—56 to 61 inches; light gray (10YR 7/1) silty clay; massive; firm, sticky and plastic; few very fine vesicular and tubular pores; slightly acid; many medium prominent strong brown (7.5YR 5/6) accumulations of soft iron masses; 10 percent sandstone gravel; moderately acid.

Range in Characteristics

Solum thickness: 30 to 60 inches
Depth to bedrock: More than 50 inches
Rock fragment content: 2 to 15 percent in the Ap horizon, 2 to 25 percent in the BA and Bt horizons, and 2 to 35 percent in the BC and C horizons
Reaction: Very strongly acid to moderately acid in the Ap horizon, unless limed, very strongly acid or strongly acid in BA horizon, very strongly acid to moderately acid in upper part of the Bt horizon, generally increasing with depth and ranging to neutral in lower part of Bt horizon, and moderately acid to slightly alkaline in the 2C horizon

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—silt loam

BE horizon:
Hue—7.5YR or 10YR
Value—5
Chroma—4 to 6

Texture—silt loam 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 in the fine earth fraction
Special feature—redoximorphic colors of low and high chroma are within the upper 10 inches

2C horizon:
Hue—7.5YR to 5Y or neutral
Value—4 to 6
Chroma—0 to 6
Texture—silty clay loam, silty clay, or clay in the fine earth fraction

Lily Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Physiographic provinces: Valley and Ridge and Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Ridges and spurs
Parent material: Sandstone
Slope range: 7 to 65 percent

Associated Soils

• Areas of Alticrest soils, which have more sand and less clay than Lily soils
• Areas of Berks soils, which formed in residuum derived from shale, have more rock fragments and more silt than Lily soils, and are on landscapes similar to or lower than those of Lily soils
• Areas of Brushy soils, which formed in residuum derived from cherty limestone, have more rock fragments than Lily soils, and are on hills and spur ridges on landscapes lower than those of Lily soils
• Areas of very deep Cedarcreek soils, which formed in regolith derived from surface mining operations and are on shoulders, back slopes, foot slopes, and toe slopes on landscapes lower than those of Lily soils
• Areas of deep Grimsley soils, which formed in colluvium derived from sandstone and shale, have more rock fragments than Lily soils, and are on ridges and spur ridges on landscapes lower than those of Lily soils, and in drainageways
• Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone, siltstone, and shale, have more rock fragments than Lily soils, and are on ridges and spur ridges on landscapes lower than those of Lily soils, and in drainageways
• Areas of Wallen soils, which have more rock fragments than Lily soils and are on ridges on landscapes similar to or higher than those of Lily soils
• Areas of shallow Weikert soils, which formed in residuum derived from shale, have more rock fragments and more silt than Lily soils, and are on landscapes similar to or lower than those of Lily soils

Typical Pedon

Lily fine sandy loam, 25 to 35 percent slopes, about 3 miles west of Richlands, 1.25 miles northwest of Raven, 1.9 miles north on VA-618 from intersection of VA-618 and VA-67 in Raven, 200 feet east, latitude of 37 degrees, 6 minutes, 8.2 seconds N. and longitude of 81 degrees, 52 minutes, 10.9 seconds W., in Richlands in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; hardwood leaf litter and twigs; abrupt smooth boundary.
A—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; moderate fine granular structure; very friable, nonsticky and nonplastic; common fine, medium, and coarse roots; common fine vesicular and tubular pores; 2 percent sandstone gravel; very strongly acid; clear smooth boundary.
Bt1—4 to 14 inches; yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; common fine vesicular and tubular pores; few faint discontinuous clay films on faces of peds; 2 percent sandstone gravel; very strongly acid; gradual wavy boundary.
Bt2—14 to 24 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable, slightly sticky and plastic; common fine roots; common fine vesicular and tubular pores; common distinct continuous clay films on faces of peds; 5 percent sandstone gravel; very strongly acid; gradual wavy boundary.
Bt3—24 to 30 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable, slightly sticky and plastic; few fine roots; common fine vesicular and tubular pores; common distinct continuous clay films on faces of peds; 10 percent sandstone gravel; very strongly acid; clear wavy boundary.
C—30 to 36 inches; yellowish brown (10YR 5/6) gravelly sandy loam; massive; firm, nonsticky and nonplastic; few fine roots; few fine vesicular and tubular pores; 30 percent sandstone gravel; strongly acid; clear wavy boundary.
R—36 inches; weathered sandstone.

Range in Characteristics

Solum thickness: 20 to 40 inches

Depth to bedrock: 20 to 40 inches
Rock fragment content: Sandstone fragments; 0 to 15 percent in the A, Ap, and E horizons; 0 to 30 percent in the B horizon; and 0 to 35 percent in the Bt, BC, and C horizons
Reaction: Extremely acid to strongly acid throughout, unless limed

A horizon:
Hue—7.5YR or 10YR
Value—2 to 5
Chroma—1 to 3
Texture—fine sandy loam

Ap and E horizon: (where they occur)
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 4
Texture—fine sandy loam in the fine earth fraction

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 or C horizon:
Hue—2.5YR to 10YR
Value—4 to 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

Lindside Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Flood plains
Parent material: Alluvium derived from limestone-influenced soils on uplands
Slope range: 0 to 3 percent

Associated Soils

• Areas of Coursey soils, which are on low terraces above flood plains and have less silt and more sand than Lindside soils
• Areas of Guernsey soils, which are on low terraces above flood plains and have more clay than Lindside soils
• Areas of poorly drained Melvin soils, which are subject to frequent flooding, are on landscapes similar to those of Lindside soils, and are in depressions on landscapes slightly lower than those of Lindside soils
• Areas of somewhat poorly drained Newark soils, which are on landscapes similar to those of Lindside soils
• Areas of poorly drained Purdy soils, which are on low terraces above flood plains and have more clay than Lindside soils

Typical Pedon

Lindside silt loam, in an area of Newark-Lindside complex, 0 to 3 percent slopes, occasionally flooded, about 0.8 mile southwest of Tazewell, 0.4 mile south-southwest of U.S. 460 Bypass, 100 feet west of Plum Creek, latitude of 37 degrees, 6 seconds, 53 minutes N. and longitude of 81 degrees, 33 minutes, 38 seconds W., in Tazewell South in the Virginia Quadrangle; in cropland:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine roots; many very fine vesicular and tubular pores; slightly acid; clear smooth boundary.
Bw1—9 to 20 inches; brown (10YR 4/3) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular and tubular pores; moderately acid; clear wavy boundary.
Bw2—20 to 34 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular and tubular pores; 40 percent fine and medium distinct dark yellowish brown (10YR 4/4) accumulations of soft iron masses; moderately acid; gradual wavy boundary.
BC—34 to 51 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; many very fine vesicular and tubular pores; 25 percent fine distinct dark yellowish brown (10YR 4/4) accumulations of soft iron masses; slightly acid; clear wavy boundary.
C—51 to 61 inches; dark gray (2.5Y 4/1) silty clay loam; massive; friable, sticky and slightly plastic; common very fine vesicular and tubular pores; 28 percent medium distinct light gray (10YR 6/1) and 2 percent fine prominent greenish gray (5BG 5/1) iron depletions; 3 percent rounded sandstone, shale, and limestone pebbles; neutral.

Range in Characteristics

Solum thickness: 25 to 50 inches
Depth to bedrock: More than 60 inches

Rock fragment content: 0 to 5 percent within a depth of 40 inches and 0 to 30 percent below that depth
Reaction: Strongly acid to slightly alkaline in the upper part of the profile, moderately acid to slightly alkaline in lower part

Ap horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam

BA and Bw horizons:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—3 to 6 above a depth of 20 inches, 1 to 4 below that depth
Texture—silt loam or silty clay loam

BC horizon:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—1 to 4
Texture—silt loam, silty clay loam, or clay loam

C horizon (where it occurs):
Hue—7.5YR to 2.5Y
Value—3 to 6
Chroma—1 to 4
Texture—silt loam, silty clay loam, loam, clay loam, very fine sandy loam, fine sandy loam, or sandy loam

Litz Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Hills
Parent material: Shale interbedded with fine grained sandstone and siltstone and scattered limestone
Slope range: 15 to 60 percent

Associated Soils

• Areas of Carbo soils, which formed in residuum derived from limestone, have more clay, fewer rock fragments, and more rock outcrops than Litz soils, and are on landscapes similar to or lower than those of Litz soils
• Areas of shallow Chiswell soils on landscapes similar to those of Litz soils
• Areas of very deep Groseclose soils, which formed mainly in limestone, have more clay and fewer rock fragments than those in Litz soils, and are on landscapes similar to or lower than those of Litz soils

Typical Pedon

Litz channery loam, in an area of Chiswell-Litz complex, 35 to 60 percent slopes, about 3.7 miles east of town of Richlands, 0.1 mile south of VA-631, latitude of 37 degrees, 6 minutes, 12 seconds N. and longitude of 81 degrees, 42 minutes, 32 seconds W., in Pounding Mill in the Virginia Quadrangle; in woodland:

A—0 to 5 inches; brown (10YR 5/3) channery loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine vesicular and tubular pores; 15 percent shale channers; strongly acid; clear smooth boundary.
E—5 to 11 inches; yellowish brown (10YR 5/4) channery loam; weak fine granular structure; friable, slightly sticky and nonplastic; common fine to coarse roots; many very fine vesicular and tubular pores; 30 percent shale channers; strongly acid; clear wavy boundary.
Bw/Bt—11 to 26 inches; 70 percent dark yellowish brown (10YR 4/4) very channery loam (Bw); 30 percent irregularly shaped areas of strong brown (7.5YR 5/6) very channery clay loam (Bt); weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common medium and coarse roots; common very fine and fine vesicular and tubular pores; 45 percent shale channers; very strongly acid; abrupt wavy boundary.
R—26 inches; shale.

Range in Characteristics

Solum thickness: 10 to 30 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Shale fragments; 5 to 35 percent in the A, Ap, and E horizons and 35 to 75 percent in the Bw/Bt and C horizons
Reaction: Very strongly acid or strongly acid unless limed

A horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 6
Texture—loam in the fine earth fraction

Ap horizon (where it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—loam, silt loam, or silty clay loam in the fine earth fraction

E horizon:
Hue—7.5YR or 10YR

Value—4 to 8
Chroma—2 to 4
Texture—loam or silt loam in the fine earth fraction

Bw/Bt horizon:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—3 to 8
Texture—in the fine earth fraction, loam or silt loam in the Bw part and clay loam or silty clay loam in the Bt part

C horizon (where it occurs):
Hue—5YR to 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—loam, silt loam, clay loam, or silty clay loam in the fine earth fraction

Madsheep Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Physiographic province: Valley and Ridge
Landform: Mountains
Parent material: Acid, red shale interbedded with fine grained sandstone, mudrock, and siltstone
Slope range: 7 to 65 percent

Associated Soils

• Areas of Paddyknob soils, which formed in material, dominantly sandstone, that is yellower than that in which Madsheep soils formed, have more sand and less silt than Madsheep soils, and are on ridges on landscapes higher than those of Madsheep soils

Typical Pedon

Madsheep channery silt loam, 35 to 55 percent slopes, very stony, about 5 miles southeast of Tazewell, 1.4 miles south of VA-604, on Clinch Mountain below Beartown Wilderness area, latitude of 37 degrees, 4 minutes, 49 seconds N. and longitude of 81 degrees, 26 minutes, 24 seconds W., in Hutchinson Rock in the Virginia Quadrangle; in woodland:

Oi—3 inches to 0; partly decomposed and undecomposed, loose leaves and twigs.
A—0 to 5 inches; dark brown (7.5YR 3/2) channery silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular and tubular pores; 20 percent shale channers; strongly acid; abrupt wavy boundary.
Bw—5 to 22 inches; yellowish red (5YR 4/6) very channery silt loam; weak medium subangular blocky structure; friable, slightly sticky and nonplastic; many medium and coarse roots; many very fine and fine vesicular and tubular pores; 50 percent shale channers; very strongly acid; clear wavy boundary.
C—22 to 25 inches; reddish brown (5YR 4/4) extremely channery silt loam; weak fine granular structure; friable, slightly sticky and nonplastic; common very fine and fine vesicular and tubular pores; 65 percent shale channers; very strongly acid; abrupt wavy boundary.
R—25 inches; weathered shale.

Range in Characteristics

Solum thickness: 20 to 30 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Shale, siltstone, fine grained sandstone, or mudrock channers or flags; 15 to 25 percent in the A horizon, 25 to 55 percent in individual subhorizons of the Bw horizon, and 45 to 75 percent in the C horizon
Reaction: Very strongly acid or strongly acid throughout

A horizon:
Hue—7.5YR or 5YR
Value—3 or 4
Chroma—2 to 4
Texture—silt loam or loam in the fine earth fraction

Bw horizon:
Hue—5YR or 2.5YR
Value—3 to 5
Chroma—3 to 6
Texture—silt loam or loam in the fine earth fraction

C horizon:
Hue—5YR or 2.5YR
Value—3 to 5
Chroma—3 or 4
Texture—loam or silt loam in the fine earth fraction

Melvin Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Flood plains
Parent material: Alluvium derived from limestone, shale, siltstone, and sandstone
Slope range: 0 to 2 percent

Associated Soils

• Areas of moderately well drained Lindside soils,

which are subject to occasional flooding and are on landscapes similar to and in areas slightly higher to those of Melvin soils
• Areas of somewhat poorly drained Newark soils, which are subject to occasional flooding and are on landscapes similar to and in areas slightly higher to those of Melvin soils
• Areas of Purdy soils, which have more clay than Melvin soils and are on terraces above flood plains

Typical Pedon

Melvin silt loam, 0 to 2 percent slopes, frequently flooded, 11 miles east-southeast of Tazewell, about 3.5 miles south-southeast of VA-61, and 1.25 miles southeast of intersection of VA-623 and VA-666, latitude of 37 degrees, 6 minutes, 20 seconds N. and longitude of 81 degrees, 19 minutes, 59 seconds W., in Garden Mountain in the Virginia Quadrangle; in pasture:

Ap1—0 to 3 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine roots; common very fine vesicular and tubular pores; slightly acid; clear smooth boundary.
Ap2—3 to 10 inches; light brownish gray (10YR 6/2) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine roots; common very fine vesicular and tubular pores; common fine prominent brown (7.5YR 4/4) accumulations of soft iron masses; slightly acid; clear smooth boundary.
Bg—10 to 30 inches; dark gray (10YR 4/1) and dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine roots; common very fine vesicular and tubular pores; common fine prominent brown (7.5YR 4/4) accumulations of soft iron masses; moderately acid; gradual wavy boundary.
Cg1—30 to 50 inches; very dark gray (10YR 4/1) silt loam; massive; friable, slightly sticky and slightly plastic; many fine vesicular and tubular pores; 5 percent sandstone gravel; moderately acid; clear wavy boundary.
Cg2—50 to 62 inches; dark gray (10YR 4/1) gravelly sandy loam; massive; very friable, nonsticky and nonplastic; many fine vesicular and tubular pores; 20 percent sandstone gravel; slightly acid.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 5 percent to a depth of 30 inches; below that depth, in individual subhorizons, a range to 20 percent to a depth of 40 inches and a range to 35 percent below that depth
Reaction: Moderately acid to slightly alkaline throughout

Ap horizon:
Hue—10YR to 5Y
Value—4 to 7
Chroma—1 to 4
Texture—silt loam

Bg horizon:
Hue—10YR to 5Y, or N/
Value—4 to 7
Chroma—2 or less
Texture—silt loam or silty clay loam

Cg horizon:
Hue—10YR to 5Y, or N/
Value—4 to 7
Chroma—2 or less
Texture—loam, silt loam, silty clay loam, or sandy loam in the fine earth fraction (sandy loam is restricted to a depth below 40 inches)
Special feature—in some pedons, below a depth of 40 inches, stratified layers of loams, clays, and sands or of sand and gravel

Murrill Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate above a depth of 40 inches and moderately slow below that depth
Physiographic province: Valley and Ridge
Landform: Ridges and spurs
Parent material: Colluvium derived from acid sandstone and shale
Slope range: 2 to 35 percent
Note: Murrill soils in this survey area are a taxadjunct to the Murrill series because of a higher clay content in the 2B horizon. This difference does not affect use and management of the Murrill soils.

Associated Soils

• Areas of moderately deep Bland soils, which formed in residuum derived from limestone and are on spur ridges on landscapes higher than those of Murrill soils
• Areas of moderately deep Carbo soils, which formed in residuum derived from limestone, have more clay than Murrill soils, and are on hills and spur ridges on landscapes lower than those of Murrill soils
• Areas of Frederick soils, which formed in residuum derived from limestone, have more clay at shallow depths than Murrill soils, and are on hills on

landscapes similar to or lower than those of Murrill soils
• Areas of Oriskany soils, which have more rock fragments than Murrill soils, do not have a lithologic discontinuity within a depth of 60 inches, and are on landscapes similar to or higher than those of Murrill soils

Typical Pedon

Murrill silt loam, 7 to 15 percent slopes, about 2.2 miles southwest of Tazewell, 0.1 mile east of VA-16, 3.8 miles south-southeast of intersection of VA-16 and U.S. 19 and 460, latitude of 37 degrees, 3 minutes, 10 seconds N. and longitude of 81 degrees, 31 minutes, 6 seconds W., in Tazewell South in the Virginia Quadrangle; in cropland:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; common very fine roots; many very fine vesicular and tubular pores; 3 percent sandstone pebbles; strongly acid; abrupt smooth boundary.
Bt1—10 to 22 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular and tubular pores; common faint patchy clay films on faces of peds; 2 percent sandstone pebbles; strongly acid; gradual wavy boundary.
Bt2—22 to 44 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; many very fine vesicular and tubular pores; common faint discontinuous clay films on faces of peds; very strongly acid; clear wavy boundary.
2Bt3—44 to 56 inches; mixed yellowish red (5YR 5/6) and strong brown (7.5YR 5/6) gravelly clay; moderate medium subangular blocky structure; firm, sticky and plastic; many very fine vesicular pores; common faint discontinuous clay films on faces of peds; 25 percent sandstone pebbles; very strongly acid; clear wavy boundary.
2Bt4—56 to 61 inches; strong brown (7.5YR 4/6) gravelly clay; weak medium subangular blocky structure; firm, sticky and plastic; common very fine vesicular pores; common faint discontinuous clay films on faces of peds; 20 percent sandstone pebbles; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Rock fragment content: Mostly sandstone pebbles, but including up to 30 percent shale channers in the A, E, and Bt horizons and up to 40 percent shale channers in the 2B horizon
Reaction: Moderately acid to very strongly acid

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—silt loam

E horizon (where it occurs):
Hue—10YR
Value—5 or 6
Chroma—3 to 6
Texture—silt loam, loam, or sandy loam

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 6
Texture—silt loam, loam, silty clay loam, clay loam, or sandy clay loam in the fine earth fraction

2Bt horizon:
Hue—2.5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silty clay loam, silty clay, clay, clay loam, and loam in the fine earth fraction
Special feature—in the 2Bt horizon, common mixed colors, including red and gray

Newark Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Flood plains
Parent material: Alluvium derived from limestone-influenced soils on uplands
Slope range: 0 to 3 percent

Associated Soils

• Areas of moderately well drained Coursey soils, which are on low terraces above flood plains and have more sand and less silt than Newark soils
• Areas of moderately well drained Guernsey soils, which are on low terraces above flood plains and have more clay than Newark soils
• Areas of moderately well drained Lindside soils on landscapes similar to those of Newark soils
• Areas of poorly drained Melvin soils, which are subject to frequent flooding and are on landscapes similar to those of Newark soils and in slight

depressions on landscapes lower than those of Newark soils
• Areas of poorly drained Purdy soils, which are on low terraces above flood plains and have more clay than Newark soils

Typical Pedon

Newark silt loam, in an area of Newark-Lindside complex, 0 to 3 percent slopes, occasionally flooded, about 7.7 miles east of Bluefield, VA, 250 feet west of VA-623, 50 feet north of Crooked Run Creek, latitude of 37 degrees, 6 minutes, 27 seconds N. and longitude of 81 degrees, 21 minutes, 3 seconds W.,
in Garden Mountain in the Virginia Quadrangle;
in pasture:

Ap—0 to 5 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular and tubular pores; slightly acid; clear smooth boundary.
Bw—5 to 19 inches; mixed brown (10YR 5/3) and grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine and fine vesicular and tubular pores; common fine prominent strong brown (7.5YR 4/6) accumulations of soft iron masses; moderately acid; clear wavy boundary.
Bg—19 to 30 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few very fine and fine roots; common very fine and fine vesicular and tubular pores; common fine prominent brown (7.5YR 4/4) accumulations of soft iron masses; slightly acid; gradual wavy boundary.
Cg1—30 to 45 inches; gray (10YR 5/1) silty clay loam; massive; firm, sticky and plastic; common very fine and fine vesicular and tubular pores; common fine distinct yellowish brown (10YR 5/4) and common fine prominent dark yellowish brown (10YR 4/6) accumulations of soft iron masses; slightly acid; gradual wavy boundary.
Cg2—45 to 61 inches; dark gray (10YR 4/1) silty clay loam; massive; firm, sticky and slightly plastic; common very fine vesicular pores; common fine prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 4/6) accumulations of soft iron masses; slightly acid.

Range in Characteristics

Solum thickness: 20 to 50 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 5 percent to a depth of 30 inches, 0 to 15 percent below a depth of 30 inches, and 0 to 60 percent below a depth of 40 inches
Reaction: Moderately acid to slightly alkaline throughout

Ap horizon:
Hue—7.5YR to 2.5Y
Value—3 to 5; value of 3 restricted to layers less than 6 inches thick
Chroma—2 to 4
Texture—silt loam

Bw horizon:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

Bg horizon:
Hue—2.5Y to 7.5YR
Value—4 to 7
Chroma—0 to 2
Texture—silt loam or silty clay loam

BC horizon (where it occurs):
Hue—2.5Y to 7.5YR
Value—4 to 7
Chroma—0 to 2
Texture—silt loam, silty clay loam, or clay loam

Cg horizon:
Hue—2.5Y to 7.5YR, or neutral
Value—4 to 7
Chroma—0 to 2
Texture—silt loam, silty clay loam, or clay loam

Newbern Series

Depth class: Shallow
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid
Physiographic province: Valley and Ridge
Landform: Escarpments, generally along streams
Parent material: Limestone in some places interbedded with shale or siltstone
Slope range: 25 to 70 percent

Associated Soils

• Areas of moderately deep Carbo soils, which have more clay than Newbern soils and are on landscapes higher than those of Newbern soils
• Areas of very deep Frederick soils, which have

more clay and fewer rock outcrops than Newbern soils and are on landscapes higher than those of Newbern soils

Typical Pedon

Newbern silt loam, in an area of Newbern-Rock outcrop complex, 25 to 70 percent slopes, about 5.7 miles southeast of Richlands, about 1.4 miles west-northwest of intersection of VA-91 and VA-609, 75 feet southwest of Little River, 2.5 miles south-southeast of U.S. 19 and 460, latitude of 37 degrees, 2 minutes, 9 seconds N. and longitude of 81 degrees, 42 minutes, 21 seconds W., in Richlands in the Virginia Quadrangle; in woodland:

A—0 to 5 inches; dark yellowish brown (10YR 3/4) silt loam; weak fine granular structure; friable; many very fine roots; many very fine pores; 10 percent limestone and chert fragments; neutral; clear smooth boundary.
Bw—5 to 14 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; common very fine roots; many very fine pores; 10 percent limestone and chert fragments; neutral; abrupt wavy boundary.
R—14 inches; limestone.

Range in Characteristics

Solum thickness: 10 to 18 inches
Depth to bedrock: 10 to 20 inches
Rock fragment content: Shale, siltstone, limestone, or chert fragments; 15 to 40 percent in the A or Ap horizon, 5 to 65 percent in the Bw horizon, and 5 to 80 percent in the Cr horizon; on average, less than 35 percent in the control section
Reaction: Moderately acid to neutral in the A horizon, slightly acid to neutral in the Bw horizon, and neutral to moderately alkaline in the C horizon

A or Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—3 to 6
Texture—silt loam

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 or 6
Texture—silt loam or loam in the fine earth fraction

C horizon (where it occurs):
Hue—10YR
Value—5 or 6
Chroma—6 or 8
Texture—silt loam or loam in the fine earth fraction

Oriskany Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Physiographic province: Valley and Ridge
Landform: Ridges, spurs, and drainageways
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Slope range: 7 to 55 percent

Associated Soils

• Areas of moderately deep Berks soils, which formed in residuum derived from shale, have shale fragments, and are on ridges and spur ridges on landscapes similar to or higher than those of Oriskany soils
• Areas of moderately deep Bland soils, which formed in residuum derived from limestone, have more clay and fewer rock fragments than Oriskany soils, and are on ridges and spur ridges on landscapes lower than those of Oriskany soils, above drainageways
• Areas of moderately deep Calvin soils, which formed in residuum derived from shale, have shale fragments, and are on ridges on landscapes similar to or higher than those of Oriskany soils
• Areas of moderately deep Carbo soils, which formed in residuum derived from limestone, have more clay and fewer rock fragments than Oriskany soils, and are on spur ridges on landscapes lower than those of Oriskany soils, above drainageways
• Areas of Frederick soils, which formed in residuum derived from limestone, have more clay and fewer rock fragments than Oriskany soils, and are on hills on landscapes lower than those of the Oriskany soils
• Areas of moderately deep Lily soils, which formed in residuum derived from sandstone, have fewer rock fragments than Oriskany soils, and are on summits and shoulders on ridges and spur ridges on landscapes higher than those of Oriskany soils
• Areas of Murrill soils, which have fewer rock fragments than Oriskany soils, have a lithologic discontinuity within a depth of 60 inches, and are on foot slopes and toe slopes on landscapes similar to or lower than those of Oriskany soils
• Areas of Poplimento soils, which formed in residuum derived from shale, have more clay and fewer rock fragments than Oriskany soils, and are on landscapes similar to those of Oriskany soils and on spur ridges on landscapes higher than those of Oriskany soils
• Areas of moderately deep Wallen soils, which formed in residuum derived from sandstone and are on ridges on landscapes higher than those of Oriskany soils
• Areas of shallow Weikert soils, which formed in residuum derived from shale, have shale fragments,

and are on ridges and spur ridges on landscapes similar to or higher than those of Oriskany soils
• Areas of deep Westmoreland soils, which formed in residuum derived from shale, have fewer rock fragments than Oriskany soils, and are on spur ridges on landscapes similar to or higher than those of Oriskany soils

Typical Pedon

Oriskany gravelly fine sandy loam, 35 to 55 percent slopes, extremely stony, about 2.4 miles south of town of Bluefield, 1,450 feet east of VA-662, 0.5 mile north-northwest of VA-61, 1.5 miles west-southwest of Bland County line, latitude of 37 degrees, 11 minutes, 4 seconds N. and longitude of 81 degrees, 17 minutes, 53 seconds W., in Cove Creek in the Virginia Quadrangle; in woodland:

A—0 to 6 inches; dark brown (10YR 3/3) gravelly fine sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine vesicular and tubular pores; 25 percent sandstone gravel; strongly acid; clear smooth boundary.
E—6 to 14 inches; yellowish brown (10YR 5/6) very cobbly fine sandy loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; common fine and medium roots; many very fine and fine vesicular and tubular pores; 45 percent sandstone cobbles; very strongly acid; gradual wavy boundary.
Bt—14 to 61 inches; strong brown (7.5YR 5/6) extremely stony sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and coarse roots; many very fine and fine vesicular and tubular pores; common faint clay films on faces of peds; 60 percent sandstone stones; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragment content: Sandstone and quartzite fragments; 15 to 65 percent in the A and E horizons and 35 to 75 percent in the Bt and C horizons
Reaction: Very strongly acid or strongly acid throughout, unless limed

A horizon:
Hue—7.5YR or 10YR
Value—2 to 4
Chroma—2 or 3
Texture—fine sandy loam in the fine earth fraction

E horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 or 6
Texture—sandy loam, fine sandy loam, or loam in the fine earth fraction

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

C horizon (where it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—sandy loam, loam, or sandy clay loam in the fine earth fraction

Paddyknob Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Rapid
Physiographic province: Valley and Ridge
Landform: Mountains
Parent material: Acid sandstone interbedded with shale and siltstone
Slope range: 15 to 80 percent

Associated Soils

• Areas of Madsheep soils, which formed in red residuum derived dominantly by shale, have more silt and less sand than Paddyknob soils, and are on landscapes lower than those of Paddyknob soils

Typical Pedon

Paddyknob gravelly loam, 15 to 35 percent slopes, very stony, about 6.75 miles southwest of Tazewell, 1.5 miles south of VA-91, 0.75 mile northeast of lookout tower atop Morris Knob, latitude of 37 degrees, 3 minutes, 24 seconds N. and longitude of 81 degrees, 36 minutes, 27 seconds W., in Tazewell South in the Virginia Quadrangle; in woodland:

Oi—2 inches to 0; partly decomposed and undecomposed loose leaves and twigs.
A—0 to 4 inches; dark brown (10YR 3/3) gravelly loam; weak fine granular structure; friable, nonsticky and nonplastic; common fine and medium roots; many very fine vesicular and tubular pores; 20 percent sandstone gravel; very strongly acid; abrupt wavy boundary.

Bw1—4 to 10 inches; strong brown (7.5YR 4/6) gravelly loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; common fine and few medium roots; many very fine and fine vesicular and tubular pores; 25 percent sandstone gravel; very strongly acid; clear wavy boundary.
Bw2—10 to 21 inches; strong brown (7.5YR 4/6) very gravelly sandy loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; few medium roots; many very fine and fine vesicular and tubular pores; 40 percent sandstone gravel and 10 percent sandstone cobbles; very strongly acid; clear irregular boundary.
C—21 to 26 inches; strong brown (7.5YR 5/6) very gravelly loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine vesicular and tubular pores; 35 percent sandstone gravel and 20 percent sandstone cobbles; very strongly acid; abrupt irregular boundary.
R—26 inches; sandstone.

Range in Characteristics

Solum thickness: 20 to 30 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Mostly gravel and channers, some cobbles and flags, mainly sandstone, but some siltstone or shale fragments; 15 to 35 percent in the A horizon, 20 to 60 percent in individual subhorizons of the Bw horizon, and 40 to 75 percent in the C horizon
Reaction: Extremely acid to very strongly acid

A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 4
Texture—loam in the fine earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 6
Texture—sandy loam, fine sandy loam, or loam in the fine earth fraction

C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—loamy sand, sandy loam, fine sandy loam, or loam in the fine earth fraction

Philo Series

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Moderately rapid
Physiographic province: Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Flood plains
Parent material: Alluvium derived from sandstone and shale
Slope range: 0 to 3 percent

Associated Soils

• Areas of Craigsville soils, which are very deep, are well drained, and have more rock fragments than Philo soils

Typical Pedon

Philo fine sandy loam, 0 to 3 percent slopes, frequently flooded, about 1.5 miles west-northwest of Richlands, 2,700 feet north of where Mudlick Creek passes under U.S. 460 in Doran, on a coal haul road, 150 feet west, latitude of 37 degrees, 5 minutes, 56.3 seconds N. and longitude of 81 degrees, 50 minutes, 9.6 seconds W., in Richlands in the Virginia Quadrangle; in abandoned pasture:

A—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate medium granular structure; friable, nonsticky and nonplastic; many fine and medium roots; common fine vesicular and tubular pores; strongly acid; clear smooth boundary.
Bw1—5 to 20 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common fine and medium roots; common fine vesicular and tubular pores; strongly acid; gradual smooth boundary.
Bw2—20 to 44 inches; olive brown (2.5Y 4/4) fine sandy loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; few fine roots; common fine vesicular and tubular pores; common medium distinct light brownish gray (10YR 6/2) iron depletions; common medium distinct strong brown (7.5YR 5/6) accumulations of soft iron masses; 10 percent sandstone cobbles; strongly acid; clear smooth boundary.
C—44 to 60 inches; light olive brown (2.5Y 5/4) very cobbly sandy loam; single grain; very friable, nonsticky and nonplastic; common fine vesicular and tubular pores; common medium distinct light brownish gray (2.5Y 6/2) iron depletions; few medium distinct strong brown (7.5YR 5/6) accumulations of soft iron masses; 40 percent sandstone cobbles and gravel; strongly acid.

Range in Characteristics

Solum thickness: 20 to 48 inches
Depth to bedrock: 40 inches to more than 60 inches
Rock fragment content: 0 to 20 percent in the A and Bw horizons and 0 to 40 percent in the C horizon and in the 2C horizon, where it occurs; less than 20 percent in the particle size control section
Reaction: Very strongly acid to moderately acid throughout, unless limed

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—fine sandy loam in the fine earth fraction

Bw horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—3 to 6
Chroma—3 to 6
Texture—silt loam, loam, fine sandy loam, and sandy loam in the fine earth fraction
Redoximorphic features—depletions range from dark grayish brown (10YR 4/2) to light gray (10YR 6/1); concentrations range from dark brown (7.5YR 4/4) to strong brown (7.5YR 5/8)

C horizon:
Hue—7.5YR, 10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 4; where chroma in the matrix is greater than 2, redoximorphic depletions that have chroma of 2 or less and redoximorphic concentrations that are strong brown (7.5YR 5/6 or 7.5YR 5/8), yellowish red (5YR 4/6), or redder
Texture—silt loam, loam, fine sandy loam, and sandy loam in the fine earth fraction

Pisgah Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Valleys
Parent material: Holston limestone
Slope range: 2 to 15 percent

Associated Soils

• Areas of moderately deep Carbo soils that have more clay and more rock outcrops than those in Pisgah soils and that are on landscapes similar to those of Pisgah soils

Typical Pedon

Pisgah silt loam, 2 to 7 percent slopes, about 7.6 miles east of Tazewell, 3,000 feet northwest of intersection of VA-623 and VA-727, 0.25 mile northwest of Burkes Garden Methodist Church on VA-623; latitude of 37 degrees, 6 minutes, 13 seconds N. and longitude of 81 degrees, 20 minutes, 58 seconds W.; in pasture:

A—0 to 2 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; very friable; many fine roots; common fine pores; few black mineral concretions; moderately acid; clear smooth boundary.
E—2 to 8 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; friable; common fine roots; common fine pores; few black mineral concretions; strongly acid; clear smooth boundary.
BE—8 to 13 inches; brown (10YR 4/3) clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine pores; few black mineral concretions; 1 percent gravel of angular chert; strongly acid; clear smooth boundary.
Bt1—13 to 37 inches; yellowish brown (10YR 5/8) clay; moderate medium subangular blocky structure; friable, sticky and slightly plastic; common fine roots; few fine and medium pores; common distinct clay films on faces of peds; few to common black mineral concretions; 1 percent gravel of angular chert and limestone that are easily broken; strongly acid; gradual smooth boundary.
Bt2—37 to 50 inches; yellowish brown (10YR 5/6) clay; moderate fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few medium pores; common distinct clay films on faces of peds; few faint strong brown (7.5YR 5/6) and few fine distinct yellowish red (5YR 5/6) soft masses of highly weathered chert gravel; 4 percent black mineral concretions and fragments of brownish yellow chert; black mineral coating on many peds; strongly acid; gradual smooth boundary.
C—50 to 65 inches; variegated and streaked yellowish brown (10YR 5/4), brown (10YR 5/3), and strong brown (7.5YR 5/6) clay; massive; friable, slightly sticky; 4 percent small black mineral concretions and fine fragments of chert; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 48 inches
Rock fragment content: Mostly chert gravel, but including limestone fragments; 0 to 5 percent in the

A and E horizons and 0 to 15 percent in the Bt and C horizons
Reaction: Strongly acid to slightly acid throughout

A horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—3 or 4
Texture—silt loam

Ap horizon (where it occurs):
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 or 4
Texture—silt loam, silty clay loam, or clay loam

E horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 or 4
Texture—silt loam, silty clay loam, or clay loam

BE horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 8
Texture—silty clay loam or clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 8
Texture—silty clay or clay (Bt or BC horizon); silty clay loam or clay loam (BE horizon)

The particle-size control section, on average, is less than 35 percent silt or more than 15 percent sand. In the lower part of most pedons, the Bt horizon has lithochromic masses or streaks, hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. Many pedons have dark oxide coatings or patchy yellowish red or red clay films.

BC horizon (where it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 8
Texture—silty clay or clay

C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 8
Texture—silty clay loam, silty clay, or clay
Note—The horizon is either variegated or streaked.

Pope Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate or moderately rapid
Physiographic province: Valley and Ridge
Landform: Flood plains
Parent material: Alluvium derived from acid sandstone and shale
Slope range: 0 to 2 percent

Associated Soils

- Areas of moderately well drained Coursey soils that are on low terraces above flood plains and that have more clay and less sand than those in Pope soils
- Areas of Craigsville soils that are subject to frequent flooding, that have more rock fragments than those in Pope soils, and that are on flood plains in positions similar to or lower than those of Pope soils
- Areas of moderately well drained Guernsey soils that are on foot slopes above flood plains and that have more clay than that in Pope soils

Typical Pedon

Pope fine sandy loam, 0 to 2 percent slopes, rarely flooded, about 3.5 miles south of Bluefield, VA, 100 feet south of VA-61, 800 feet west of the Tazewell-Bland County line, latitude of 37 degrees, 11 minutes, 3 seconds N. and longitude of 81 degrees, 16 minutes, 19 seconds W., in Cove Creek in the Virginia Quadrangle; in cropland:

Ap—0 to 8 inches; dark yellowish brown (10YR 3/4) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular and tubular pores; 5 percent rounded sandstone pebbles; moderately acid; abrupt wavy boundary.

Bw1—8 to 15 inches; dark brown (7.5YR 3/4) gravelly sandy loam; weak fine subangular blocky structure; very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular and tubular pores; 15 percent rounded sandstone pebbles; strongly acid; clear wavy boundary.

Bw2—15 to 27 inches; strong brown (7.5YR 4/6) sandy loam; weak medium subangular blocky structure; very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine vesicular and tubular pores; 5 percent rounded sandstone pebbles; strongly acid; clear wavy boundary.

Bw3—27 to 45 inches; strong brown (7.5YR 4/6) gravelly sandy loam; weak medium subangular blocky structure; very friable, nonsticky and nonplastic; few very fine roots; many very fine and

fine vesicular and tubular pores; 20 percent rounded sandstone pebbles; very strongly acid; clear wavy boundary.
C—45 to 64 inches; strong brown (7.5YR 4/6) very gravelly loamy sand; single grain; loose; many fine vesicular and tubular pores; 45 percent rounded sandstone pebbles; very strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 30 percent to a depth of about 40 inches and 0 to 75 percent below that depth
Reaction: Strongly acid to extremely acid throughout, unless limed

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture—fine sandy loam in the fine earth fraction

Bw horizon:
Hue—7.5YR to 10YR
Value—4 to 6
Chroma—4 to 6
Texture—sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine earth fraction

C horizon:
Hue—7.5YR to 10YR
Value—4 to 6
Chroma—3 to 6
Texture—loamy sand, loamy fine sand, sandy loam, fine sandy loam, loam, or sandy clay loam in the fine earth fraction

Poplimento Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Physiographic province: Valley and Ridge
Landform: Hills and spurs
Parent material: Shale interbedded with limestone
Slope range: 7 to 60 percent

Associated Soils

• Areas of moderately deep Berks soils, which have more rock fragments than Poplimento soils and are on ridges and spur ridges on landscapes similar to or higher than those of Poplimento soils
• Areas of moderately deep Bland soils, which are redder than Poplimento soils, formed in residuum derived from limestone, and are on hills and spur ridges on landscapes lower than those of Poplimento soils
• Areas of moderately deep Calvin soils, which formed in residuum derived from red, noncalcareous shale and sandstone, have less clay and more rock fragments than Poplimento soils, and are on ridges higher than those of Poplimento soils
• Areas of Oriskany soils, which formed in colluvium derived from sandstone and shale, have more rock fragments than Poplimento soils, and are on landscapes similar to those of Poplimento soils, and in drainageways
• Areas of Westmoreland soils, which have a thinner solum and less clay than Poplimento soils and are on landscapes similar to those of Poplimento soils

Typical Pedon

Poplimento silt loam, in an area of Poplimento-Westmoreland complex, 7 to 15 percent slopes, about 0.25 mile east of Tazewell, 0.1 mile north of VA-600 (Dial Rock Road), on a low knoll near Farm Lake, latitude of 37 degrees, 8 minutes, 25 seconds N. and longitude of 81 degrees, 28 minutes, 53 seconds W., in Tiptop in the Virginia Quadrangle; in pasture:

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular and tubular pores; moderately acid; clear smooth boundary.
Bt1—6 to 11 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine vesicular and tubular pores; common faint patchy clay films on faces of peds; strongly acid; clear wavy boundary.
Bt2—11 to 35 inches; yellowish brown (10YR 5/6) silty clay; moderate fine and medium subangular blocky structure; firm, sticky and plastic; few very fine roots; common very fine and fine vesicular and tubular pores; common faint discontinuous clay films on faces of peds; strongly acid; clear wavy boundary.
Bt3—35 to 45 inches; yellowish brown (10YR 5/6) clay; moderate fine subangular blocky structure; firm, sticky and plastic; common very fine and fine vesicular and tubular pores; many faint discontinuous clay films on faces of peds; very strongly acid; clear wavy boundary.
BC1—45 to 56 inches; yellowish brown (10YR 5/4) channery silty clay loam; moderate fine and medium subangular blocky structure; firm, sticky

and slightly plastic; many very fine and fine vesicular and tubular pores; 20 percent shale channers; strongly acid; gradual wavy boundary.
BC2—56 to 62 inches; yellowish brown (10YR 4/6) silty clay loam; weak medium subangular blocky structure; firm, sticky and slightly plastic; many very fine and fine vesicular and tubular pores; 5 percent shale channers; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more
Depth to bedrock: More than 60 inches
Rock fragment content: Channers, mostly shale but also limestone; 0 to 15 percent in the A, E, BE, and BA horizons and in the upper part of the Bt horizon and 0 to 55 percent in the lower part of the Bt horizon and in the C horizon
Reaction: Very strongly acid to slightly acid throughout

Ap or A horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 6
Texture—silt loam

BA horizon (where it occurs):
Hue—5YR to 10YR
Value—3 to 6
Chroma—4 to 8
Texture—silt loam, silty clay loam, or silty clay

Bt horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silty clay loam, silty clay, or clay in the fine earth fraction

BC horizon:
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silty clay loam, silty clay, or clay in the fine earth fraction

C horizon (where it occurs):
Hue—5YR to 10YR
Value—4 to 6
Chroma—4 to 8
Texture—silty clay loam, silty clay, or clay in the fine earth fraction
Note—In some pedons the horizon is variegated or streaked.

Purdy Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Physiographic province: Valley and Ridge
Landform: Terrace treads
Parent material: Old alluvium and colluvium derived from limestone, shale, siltstone, and sandstone
Slope range: 0 to 2 percent

Associated Soils

- Areas of moderately well drained Coursey soils, which are on higher terraces than those of Purdy soils and have less clay than Purdy soils
- Areas of moderately well drained Guernsey soils on landscapes similar to or higher than those of Purdy soils
- Areas of moderately well drained Lindside soils, which are on flood plains and have more silt and less clay than Purdy soils
- Areas of Melvin soils, which are on flood plains and have more silt and less clay than Purdy soils
- Areas of somewhat poorly drained Newark soils, which are on flood plains and have more silt and less clay than Purdy soils

Typical Pedon

Purdy silt loam, 0 to 2 percent slopes, about 9.5 miles east-southeast of Tazewell, 0.5 mile southwest of intersection of VA-623 and VA-666, 375 feet from VA-666, latitude of 37 degrees, 6 minutes, 30 seconds N. and longitude of 81 degrees, 21 minutes, 30 seconds W., in Garden Mountain in the Virginia Quadrangle; in pasture:

Ap—0 to 6 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine vesicular and tubular pores; common medium distinct dark brown (10YR 3/3) and yellowish brown (10YR 5/6) accumulations of soft iron masses; slightly acid; clear smooth boundary.
BA—6 to 14 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky and nonplastic; common very fine roots; many very fine vesicular and tubular pores; common medium prominent strong brown (7.5YR 5/6) accumulations of soft iron masses; slightly acid; gradual wavy boundary.
Btg1—14 to 31 inches; grayish brown (10YR 5/2) silty clay; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few very fine roots; many very fine vesicular and tubular pores; few faint discontinuous clay films on faces of peds; few fine prominent strong brown (7.5YR 5/8) accumulations of soft iron masses; slightly acid; gradual wavy boundary.

Btg2—31 to 42 inches; gray (10YR 5/1) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few very fine roots; few very fine vesicular and tubular pores; common faint continuous clay films on faces of peds; few fine prominent yellowish brown (10YR 5/6) accumulations of soft iron masses; slightly acid; clear wavy boundary.

Btg3—42 to 47 inches; gray (10YR 5/1) silty clay; weak medium subangular blocky structure; firm, sticky and plastic; common very fine vesicular and tubular pores; few faint discontinuous clay films on faces of peds; few fine prominent brownish yellow (10YR 6/6) and dark reddish brown (5YR 3/4) accumulations of soft iron masses; 10 percent sandstone gravel; moderately acid; clear wavy boundary.

C—47 to 61 inches; gray (10YR 6/1) gravelly clay loam; massive; firm, slightly sticky and slightly plastic; many very fine vesicular and tubular pores; common medium prominent strong brown (7.5YR 5/6) accumulations of soft iron masses; 30 percent sandstone gravel; moderately acid.

Range in Characteristics

Solum thickness: 28 to 50 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 0 to 5 percent to a depth of 20 inches, 0 to 25 percent at a depth of 20 to 40 inches, and 15 to 50 percent below a depth of 40 inches
Reaction: Strongly acid to slightly acid throughout

Ap horizon:
Hue—10YR, 2.5Y, or neutral
Value—3 to 5
Chroma—0 to 2
Texture—silt loam, silty clay loam, or loam

BA horizon:
Hue—10YR to 5Y, or neutral
Value—4 or 5
Chroma—0 to 2
Texture—silt loam, clay loam, silty clay loam, silty clay, or clay

Bt horizon:
Hue—10YR to 5Y, or neutral
Value—4 or 5
Chroma—0 to 2
Texture—generally silty clay or clay, but includes silty clay loam, clay loam, or their gravelly analog

C horizon:
Hue—10YR to 5Y, or neutral
Value—4 to 6
Chroma—0 to 3
Texture—silty clay, clay, clay loam, silty clay loam, or their gravelly or very gravelly analogs

Timberville Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Hills and drainageways
Parent material: Colluvium and alluvium derived from limestone, sandstone, and shale
Slope range: 0 to 7 percent

Associated Soils

- Areas of moderately deep Carbo soils, which formed in residuum derived from limestone, have more clay than Timberville soils, and are on landscapes higher than those of Timberville soils
- Areas of Frederick soils, which formed in residuum derived from limestone, have more clay at shallow depths than Timberville soils, and are on landscapes higher than those of Timberville soils

Typical Pedon

Timberville silt loam, 2 to 7 percent slopes, frequently flooded, about 5.25 miles east of Tazewell, 0.1 mile north of VA-61, latitude of 37 degrees, 8 minutes, 31 seconds N. and longitude of 81 degrees, 23 minutes, 32 seconds W., in Tiptop in the Virginia Quadrangle; in pasture:

Ap—0 to 12 inches; dark yellowish brown (10YR 3/4) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine vesicular and tubular pores; 5 percent subrounded sandstone pebbles; moderately acid; clear smooth boundary.

Bw—12 to 25 inches; brown (7.5YR 4/4) silty clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine vesicular and tubular pores; 10 percent subrounded sandstone pebbles; strongly acid; clear wavy boundary.

2Bt1—25 to 35 inches; reddish brown (5YR 4/4) gravelly silty clay; weak medium subangular blocky structure; firm, sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; common faint discontinuous clay films on faces of peds; 20 percent subrounded

sandstone pebbles; very strongly acid; gradual wavy boundary.
2Bt2—35 to 61 inches; dark reddish brown (5YR 3/4) silty clay; moderate medium subangular blocky structure; firm, sticky and plastic; common very fine and fine vesicular pores; common faint discontinuous clay films on faces of peds; 5 percent subrounded sandstone pebbles; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Rock fragment content: Mostly sandstone and chert; 0 to 35 percent in the surface layer and 0 to 60 percent in individual horizons of the solum
Reaction: Extremely acid to slightly acid throughout

Ap horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 5
Texture—silt loam in the fine earth fraction

A horizon (where it occurs):
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 5
Texture—silt loam, loam, or fine sandy loam in the fine earth fraction

E horizon (where it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, loam, or fine sandy loam in the fine earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—loam, silt loam, silty clay loam, or clay loam in the fine earth fraction

2Bt horizon:
Hue—5YR to 10YR
Value—3 to 5
Chroma—4 to 8
Texture—clay, silty clay, clay loam, silty clay loam, or silt loam in the fine earth fraction

Tumbling Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Mountains
Parent material: Colluvium derived from sandstone, quartzite, and shale
Slope range: 2 to 65 percent

Associated Soils

• Areas of Berks soils, which are shallower to bedrock than Tumbling soils and are on landscapes higher than those of Tumbling soils
• Areas of Chiswell soils, which are shallower to bedrock than Tumbling soils and are on landscapes higher than those of Tumbling soils
• Areas of Groseclose soils, which formed in residuum and are on landscapes higher than those of Tumbling soils
• Areas of Litz soils, which are shallower to bedrock than Tumbling soils and are on landscapes higher than those of Tumbling soils
• Areas of Weikert soils, which are shallower to bedrock than Tumbling soils and are on landscapes higher than those of Tumbling soils

Typical Pedon

Tumbling loam, in an area of Tumbling loam, 2 to 7 percent slopes, very stony, about 1.2 miles northwest of junction of VA-614 and VA-749 and 1.1 miles west of junction of VA-749 and VA-670 northwest of Cedar Springs, latitude of 36 degrees, 50 minutes, 26.0 seconds N. and longitude of 81 degrees, 18 minutes, and 18.9 seconds W; in cropland:

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine roots; many very fine vesicular and tubular pores; strongly acid; abrupt smooth boundary.
Bt1—9 to 16 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; common fine roots; many very fine vesicular and tubular pores; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.
Bt2—16 to 34 inches; strong brown (7.5YR 5/6) clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; many very fine vesicular and tubular pores; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.
Bt3—34 to 44 inches; strong brown (7.5YR 5/6) clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; many very fine vesicular and tubular pores; common distinct clay films on faces of peds;

common medium distinct red (2.5YR 5/8) soft masses of weathered rock fragments; very strongly acid; clear smooth boundary.
Bt4—44 to 62 inches; yellowish red (5YR 5/6) clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; common very fine vesicular and tubular pores; common distinct clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) soft masses of weathered rock fragments; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Depth to bedrock: More than 60 inches
Rock fragment content: 10 to 15 percent in the Ap horizon and 0 to 35 percent in the Bt horizon
Reaction: Very strongly acid or strongly acid

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—loam

Bt horizon:
Hue—2.5YR to 10YR
Value—4 or 5
Chroma—4 to 8
Texture—sandy clay loam, clay loam, silty clay loam, or clay in the fine earth fraction

Wallen Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Rapid or moderately rapid
Physiographic province: Valley and Ridge
Landform: Ridges
Parent material: Acid sandstone interbedded with fine grained shale and siltstone
Slope range: 15 to 75 percent

Associated Soils

• Areas of Berks soils, which formed in residuum derived from shale, have more silt and less sand than Wallen soils, and are on ridges and spur ridges on landscapes lower than those of Wallen soils
• Areas of Calvin soils, which are redder than Wallen soils, have more silt and less sand than Wallen soils, formed in shale and residuum derived from sandstone, and are on landscapes lower than those of Calvin soils
• Areas of Lily soils, which have fewer rock fragments than Wallen soils and are on landscapes similar to or lower than those of Wallen soils
• Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone and shale and are on landscapes lower than those of Wallen soils
• Areas of shallow Weikert soils, which formed in residuum derived from shale, have more silt and less sand than Wallen soils, and are on ridges and spur ridges on landscapes lower than those of Wallen soils

Typical Pedon

Wallen channery sandy loam, in an area of Wallen-Rock outcrop complex, 15 to 35 percent slopes, extremely stony, about 10.5 miles southwest of Tazewell, 2.7 miles northwest of county line, 125 feet north of VA-91 on Clinch Mountain, latitude of 36 degrees, 59 minutes, 9 seconds N. and longitude of 81 degrees, 39 minutes, 3 seconds W., in Broadford in the Virginia Quadrangle; in woodland:

Oi—1 inch to 0; partly decomposed and undecomposed loose leaves and twigs.
A—0 to 4 inches; very dark brown (10YR 2/2) channery sandy loam; weak fine granular structure; friable; many very fine roots; many very fine pores; 20 percent sandstone channers; strongly acid; abrupt wavy boundary.
Bw1—4 to 12 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak fine subangular blocky structure; very friable; many medium roots; many very fine pores; 40 percent sandstone channers; very strongly acid; clear wavy boundary.
Bw2—12 to 22 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak fine subangular blocky structure; very friable; common very fine and medium roots; many very fine pores; 55 percent sandstone channers and flags; very strongly acid; gradual wavy boundary.
C—22 to 24 inches; strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) extremely channery sandy loam; single grain; loose; few fine roots; many very fine pores; 65 percent sandstone flags and channers; very strongly acid; clear wavy boundary.
R—24 inches; sandstone.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Rock fragment content: Fragments, mostly sandstone, but also siltstone or shale; 15 to 35 percent in the A horizon, 35 to 60 percent in the Bw horizon, and 40 to 70 percent in the C horizon
Reaction: Very strongly acid to moderately acid

A horizon:
Hue—10YR
Value—2 or 3

Chroma—1 to 3
Texture—sandy loam in the fine earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 6
Texture—sandy loam, fine sandy loam, or loam in the fine earth fraction

C horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—4 to 6
Texture—sandy loam or loamy sand in the fine earth fraction

Weikert Series

Depth Class: Shallow
Drainage Class: Somewhat excessively drained
Permeability: Moderately rapid
Physiographic provinces: Valley and Ridge and Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section
Landform: Ridges and spurs
Parent material: Acid shale interbedded with fine grained sandstone and siltstone
Slope range: 15 to 55 percent

Associated Soils

• Areas of moderately deep Berks soils on landscapes similar to those of Weikert soils
• Areas of moderately deep Brushy soils, which formed in residuum derived from cherty limestone, have chert fragments, and are on hills and spur ridges on landscapes similar to or lower than those of Weikert soils
• Areas of Lily soils, which formed in residuum derived from sandstone, have fewer rock fragments than Weikert soils, and are on landscapes higher than those of Weikert soils
• Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone and shale and are on landscapes similar to or lower than those of Weikert soils, and in drainageways
• Areas of Wallen soils, which formed in residuum derived from sandstone, have more sand and less silt than Weikert soils, and are on ridges on landscapes higher than those of Weikert soils

Typical Pedon

Weikert channery silt loam, in an area of Berks-Weikert complex, 35 to 55 percent slopes, about 6.25 miles south of Tazewell, 0.45 mile east-southeast of intersection of VA-16 and VA-601, 0.3 mile south of Laurel Creek, 0.8 mile north of county line on Little Brushy Mountain, latitude of 37 degrees, 0 minutes, 44 seconds N. and longitude of 81 degrees, 31 minutes, 18 seconds W., in Tazewell South in the Virginia Quadrangle; in woodland:

Oi—3 inches to 0; partly decomposed and undecomposed leaves and twigs.
A—0 to 7 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine granular structure; friable; common fine and many coarse roots; many very fine pores; 25 percent shale channers; very strongly acid; clear smooth boundary.
Bw1—7 to 12 inches; yellowish brown (10YR 5/6) very channery silt loam; moderate weak fine subangular blocky structure; friable; common fine and coarse roots; many very fine pores; 50 percent shale channers; very strongly acid; clear wavy boundary.
Bw2—12 to 17 inches; yellowish brown (10YR 5/6) extremely channery silt loam; weak fine subangular blocky structure; friable; few fine and medium roots; many very fine pores; 60 percent shale channers; very strongly acid; clear wavy boundary.
C—17 to 19 inches; yellowish brown (10YR 5/6) extremely channery silt loam; weak fine granular structure; friable; common very fine pores; 80 percent shale channers; very strongly acid.
R—19 inches; fractured shale.

Range in Characteristics

Solum thickness: 12 to 20 inches
Depth to bedrock: 14 to 20 inches
Rock fragment content: Shale, siltstone, or fine grained sandstone fragments; 15 to 40 percent in the A or Ap horizon, 35 to 60 percent in the Bw horizon, and 60 to 85 percent in the C horizon
Reaction: Very strongly acid or strongly acid in A or Ap horizon; extremely acid to strongly acid in Bw and C horizons

A or Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 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—silt loam or loam in the fine earth fraction

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8
Texture—silt loam or loam in the fine earth fraction

Westmoreland Series

Depth Class: Deep and very deep
Drainage Class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Ridges and spurs
Parent Material: Shale interbedded with limestone
Slope Range: 7 to 60 percent

Associated Soils

- Areas of moderately deep Berks soils, which have more rock fragments than Westmoreland soils and are on landscapes similar to those of Westmoreland soils and on ridges higher than those of Westmoreland soils
- Areas of moderately deep Bland soils, which are redder than Westmoreland soils, formed in residuum derived from limestone, and are on landscapes lower than those of Westmoreland soils
- Areas of moderately deep Calvin soils, which formed residuum derived from red, noncalcareous shale and sandstone, have more rock fragments than Westmoreland soils, and are on ridges higher than those of Westmoreland soils
- Areas of very deep Oriskany soils, which formed in colluvium derived from sandstone and shale, have more rock fragments than Westmoreland soils, and are on landscapes similar to those of Westmoreland soils, and in drainageways
- Areas of Poplimento soils, which have a thicker solum and more clay than Westmoreland soils and are on landscapes similar to those of Westmoreland soils

Typical Pedon

Westmoreland silt loam, in an area of Westmoreland-Poplimento-Berks complex, 35 to 65 percent slopes, about 3,400 feet southeast of U.S. 19 and 460, 6,000 feet east of intersection of U.S. 19 and 460 and VA-651, 2.15 miles northeast of Tazewell, latitude of 37 degrees, 9 minutes, 20 seconds N. and longitude of 81 degrees, 27 minutes, 15 seconds W., in Tiptop in the Virginia Quadrangle; in pasture:

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular and tubular pores; 5 percent shale channers; moderately acid; abrupt smooth boundary.

BA—7 to 12 inches; strong brown (7.5YR 5/6) silty clay loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine and fine vesicular and tubular pores; 5 percent shale channers; strongly acid; gradual wavy boundary.

Bt—12 to 31 inches; strong brown (7.5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine vesicular and tubular pores; common faint discontinuous clay films on faces of peds; strongly acid; gradual wavy boundary.

BC—31 to 47 inches; brown (7.5YR 4/4) channery silt loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; many very fine and fine vesicular and tubular pores; 30 percent shale channers; strongly acid; clear wavy boundary.

C—47 to 61 inches; brown (7.5YR 4/6) very channery silt loam; massive; friable, slightly sticky and nonplastic; many very fine and fine vesicular pores; 55 percent shale channers; moderately acid.

Range in Characteristics

Solum thickness: 20 to 50 inches
Depth to bedrock: 40 to 60 inches or more
Rock fragment content: Channers, mostly shale but also limestone; 2 to 30 percent in the A, BA, and Bt horizons; 5 to 70 percent in the BC horizon; 15 to 80 percent in the CB horizon; and 45 to 90 percent in the C horizon
Reaction: Very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the C horizon

Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam

A horizon (where it occurs):
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam, loam, or silty clay loam

BA horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—silt loam, silty clay loam, or loam in the fine earth fraction

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—silt loam or silty clay loam in the fine earth fraction

BC horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 8
Texture—silt loam or silty clay loam in the fine earth fraction

CB horizon (where it occurs):
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—4 to 8
Texture—silt loam or silty clay loam in the fine earth fraction

C horizon:
Hue—7.5YR to 2.5Y
Value—4 or 5
Chroma—4 to 8
Texture—silt loam or silty clay loam in the fine earth fraction

Wolfgap Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Physiographic province: Valley and Ridge
Landform: Flood plains
Parent material: Alluvium derived from limestone, shale, siltstone, and sandstone
Slope Range: 0 to 2 percent

Associated Soils

- Areas of moderately well drained Botetourt soils on low terraces above flood plains
- Areas of moderately well drained Guernsey soils, which are on low terraces above flood plains and have more clay than Wolfgap soils

Typical Pedon

Wolfgap clay loam, in an area of Wolfgap clay loam, 0 to 2 percent slopes, occasionally flooded, about 0.3 mile west of junction of VA-42 and VA-630 and 2.3 miles east of junction of VA-42 and VA-91, latitude of 36 degrees, 55 minutes, 50.4 seconds N. and longitude of 81 degrees, 37 minutes, 44.8 seconds W; in cropland:

Ap—0 to 11 inches; dark brown (10YR 3/3) clay loam; yellowish brown (10YR 5/4) dry; moderate fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; many very fine vesicular and tubular pores; neutral; abrupt smooth boundary.
Bw1—11 to 35 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; many very fine vesicular and tubular pores; neutral; diffuse smooth boundary.
Bw2—35 to 58 inches; strong brown (7.5YR 4/6) sandy clay loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; many very fine vesicular and tubular pores; neutral; gradual smooth boundary.
C—58 to 72 inches; strong brown (7.5YR 4/6) extremely gravelly fine sandy loam; massive; friable, slightly sticky and slightly plastic; many fine vesicular and tubular pores; 65 percent gravel; neutral.

Range in Characteristics

Solum thickness: 30 to 60 inches
Depth to bedrock: More than 60 inches
Rock fragment content: Gravel and cobbles; 0 to 15 percent in the A and Ap horizons, 0 to 35 percent in the Bw horizon, and 15 to 80 percent in the C horizon
Reaction: Slightly acid to moderately alkaline

Ap horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—clay loam

A horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—2 or 3
Texture—sandy loam, fine sandy loam, loam, silt loam, or clay loam in the fine earth fraction

Bw horizon:
Hue—7.5YR or 10YR
Value—4 or 5 (in some pedons 2 or 3 in the upper part)
Chroma—4 to 6 (in some pedons 1 to 3 in the upper part)
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

Formation of the Soils

This section explains the factors and processes of soil formation as related to the soils of Tazewell County, Virginia. It identifies the five major factors of soil formation and describes their influence on the soils in the county. Also, the morphology of the soils is related to horizon nomenclature, the processes of horizon development, and the geologic characteristics of the area.

Factors of Soil Formation

Soils are formed through the interaction of five major factors— parent material, climate, plant and animal life, relief, and time. The relative influence of each factor generally varies from place to place.

Climate and plants and animals are active forces of soil formation. They act on parent material accumulated through weathering of rocks and slowly change it into soil. However, all five factors contribute to the formation of every soil. Local variations in soils are a result of differences in kind of parent material, topography, and drainage. In some places, one factor may dominate the formation of a soil and determine most of its properties. However, the combined action of the five factors determines the character of each soil.

Parent material

Parent material is the unconsolidated mass in which soils are formed. It is largely responsible for the mineralogical and chemical composition of the soil and the rate at which soil-forming processes take place. Table 22 shows how geology relates to soils.

In Tazewell County, the soils formed in four different kinds of parent material; residuum, alluvium, colluvium, and mine spoil, or regolith from surface coal mine operations.

Residuum derived from limestone, shale, siltstone, and sandstone. The soils formed in residuum derived from limestone, including dolomite, and from shale are most extensive in the valley. These soils have a wide range of characteristics. The soils formed in residuum derived from limestone typically have a silty surface layer and a clayey subsoil. They include Frederick and Pisgah soils. Berks soils formed in residuum derived from acid shale and siltstone. Dekalb soils formed in residuum derived from acid sandstone.

Alluvium of local origin is along the smaller streams and the Clinch River. The soils formed in alluvium vary in texture and development. They include Melvin, Craigsville, Philo, Allegheny, and Wolfgap soils.

Colluvium is mainly on the lower mountain slopes. It is mainly moderately coarse textured, medium textured, or moderately fine textured. Oriskany and Grimsley soils formed in colluvium.

Mine spoil consists of regolith of disturbed materials from surface coal mine operations. It is in the northern third of Tazewell County. This regolith consists of varying amounts of shale, siltstone, coal, and sandstone fragments ranging in size from gravel to boulders. Cedarcreek soils formed in regolith. They are medium textured to moderately fine textured.

Climate

Precipitation and temperature are the main climatic influences on soil formation. Water dissolves minerals, supports biological activity, and transports mineral and organic residue through the soil. Temperature determines the types of physical, chemical, and biological activities that take place in the soil and the speed at which they act.

The amount of precipitation in Tazewell County exceeds evapotranspiration, so the soils have been leached. Much soluble material originally in the soil or released through weathering has been removed. The exceptions are alluvial areas that limestone springs recharge with carbonates. Precipitation is mainly responsible for the clayey subsoil characteristic of many soils in the county.

Water leaches soluble materials. As it percolates through the soil it moves small amounts of clay from the surface to the subsoil. Consequently, with some exceptions, the soils of the county typically have more clay in the subsoil than in the surface layer. The excepted soils formed in recent alluvium, on very steep slopes, or in regolith from surface mine operations.

Tazewell County has a humid, continental climate marked by extreme seasonal temperature changes. Average annual precipitation is about 43 inches. The

Figure 16.—An exposure of Clinch Sandstone atop Paint Lick Mountain. Clinch Sandstone underlies Wallen and Lily soils in the Valley and Ridge province in the Appalachian Highlands.

average air temperature is about 51 degrees. Adequate annual precipitation and warm temperatures have provided conditions for rapid decomposition of organic matter, but have limited the accumulation of organic matter in the surface layer of these soils. For more detailed information on climate, see the climate section under "General Nature of the County."

Relief

The relief of an area has three main determinants; the underlying geologic formations, the geologic history of the general region, and the effects of dissection by rivers and streams. Relief influences soil formation through its effects on soil moisture, erosion, temperature, and plant cover.

Tazewell County is in the Appalachian Highlands, Valley and Ridge province and Appalachian Plateaus, and is dissected by the Tennessee Valley Divide. It is drained eastward into the New River, northward into the Big Sandy River, westward into the Clinch River, and southward into the Holston River.

The Valley and Ridge province of the Appalachian Highlands is mountainous. Its highest peak has an elevation of more than 4,700 feet. Relief is characterized largely by a structurally controlled drainage pattern. Its ridges and valleys run mainly southwest to northeast. The mountain systems are underlain by such resistant rocks as sandstone and quartzite. The Clinch Sandstone and the accompanying Juniata Formation are resistant to weathering (fig. 16) and have the greatest relief in the county. They mainly determine the directions of the drainage systems.

The valley relief is also affected by the underlying geology. The notable formations are Copper Ridge Dolomite, Beekmantown Dolomite, and Holston Limestone. They comprise the least resistant rocks and have the least relief in the county. Characteristically, the hillier valleys are underlain by Martinsburg and Brallier Shales.

The Appalachian Plateaus, Cumberland Plateau and Cumberland Mountain section, comprises part of the county. This part of the county has a largely defined, dendritic drainage pattern. It is underlain mainly by the Lee and Norton Formations, which consist of sandstone, shale, and coal beds.

Most soils on uplands are naturally well drained. Those on terraces and flood plains range from poorly drained to well drained. Soil drainage commonly is related to landscape position. The soils in the low, nearly level positions commonly are poorly drained. Those in more sloping areas typically are well drained.

Time

The degree of development or degree of horizon differentiation within the soil is related to the length of

time the soil has been subjected to other soil forming factors. A young soil has little or no horizon development, but an old or mature soil has strongly developed horizons.

The oldest soils in Tazewell County formed mainly in residuum derived from limestone. Frederick and Pisgah soils are examples. In general, these soils are in less sloping, relatively stable positions. They formed in easily weatherable material and have a high degree of horizon differentiation.

Soils formed in recent alluvium have been in place only a relatively short time. They show little development other than organic matter has accumulated in the surface layer. They commonly are stratified and have an irregular distribution of organic matter. Melvin and Philo soils formed in alluvium.

Soils on terraces have recognizable horizon development. Generally, they are intermediate in degree of development. They are younger than residual soils but older than alluvial soils. Allegheny soils formed on terraces.

On very steep slopes, geologic erosion has removed soil material in a relatively short time. The soils generally have not been in place long enough for development of more than moderate horizon differentiation.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

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 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.

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.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

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

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

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.

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

Bench. In surface mining, a nearly level to gently inclined cut section in a mountain slope or footslope from which a seam of coal has been removed.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

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

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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

Cation-exchange capacity. The total amount of

exchangeable cations that can be held by the soil, expressed in terms of milliequivalents 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.

Channery soil material. Soil material that is, 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.

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.

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 is 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.

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 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.

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.

Cut and filled. An area that has been disturbed or altered by human activity. As a result, the natural soil was removed and was replaced by soil or other material in an unnatural process.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

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, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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."

Drainageway. A relatively small, linear depression that, at times, moves concentrated water and has either an undefined channel or a small, defined channel.

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.

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.

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 flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

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.

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

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

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

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that is, 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.

Flood plain. 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.

Foot slope. The inclined surface at the base of a hill.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

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 is 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.

Head out. To form a flower head.

Highwall. A high, very steep to perpendicular face of rock or earth. The face was exposed in surface mining to remove coal from a seam along a mountain slope.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet (300 meters) above surrounding lowlands. It commonly is of limited summit area and has a well defined outline. On hillsides generally slopes are more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Hillslope. The generic term for the steeper part of a hill between its summit and the drainage line at the base of the hill.

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.

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.

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

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.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

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.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Mine spoil. A young soil that formed in recently deposited, earthy material resulting from deep mining or surface mining of coal.

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 (300 meters) above surrounding lowlands. It is commonly of restricted summit area (relative to a plateau). It generally has steep sides (slope greater than 25 percent). It may have considerable rock outcrop. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mountain slope. The part of a mountain between the summit and the foot.

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.

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

Outslope. The exposed area sloping away from a bench cut section.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

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:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 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.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

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.

Profile, soil. A vertical section of the soil extending

through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

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

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.

Ridge. A long, narrow elevation of the land surface, generally with a sharp crest and steep sides. It forms an extended upland between valleys. The term is used in areas of both hill and mountain relief.

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.

Riser. A vertical or steeply sloping surface, commonly one of a series of natural step-like landforms. Risers occur in successive stream terraces.

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 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.

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.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. 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 hillslope position that forms the uppermost, inclined surface near the top of a hillslope. If present, it comprises the transition zone from back slope 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.

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.

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.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spur. A subordinate ridge or lesser elevation that projects sharply from the crest or side of a hill, mountain, or other prominent range of hills or mountains.

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).

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.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest hillslope position of a hillslope profile. It commonly exhibits a nearly level 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."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

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 (geologic). A step-like surface, bordering a flood plain. It represents the former position of a flood plain. The term usually has two meanings. It applies to the relatively flat, summit surface (tread) built by stream action. It also applies to the steeper, descending slope (riser) graded to a lower, base level of erosion.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat or gently sloping surface of natural, step-like landforms, commonly one of a series, such as successive stream terraces.

Upland. Land at a higher elevation than the flood plain or a low stream terrace; also, land above the zone covered by the foot slope in the hillslope continuum.

Valley. An elongate, relatively large, externally drained depression of the earth's surface primarily developed by stream erosion.

Variable. A term applied to both landform and landscape position where the soil is altered by human activity. The term is applied wherever feasible, such as urban land, quarries, or mining activity.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-69) at Burkes Garden, Virginia)

Month	Temperature						Precipitation				
				2 years in 10 will have—				2 years in 10 will have—			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than—	Minimum temperature lower than—	Average number of growing degree days*	Average	Less than—	More than—	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	37.1	16.6	26.9	61	-15	24	3.22	1.97	4.35	7	14.9
February	40.5	19.0	29.7	66	-8	40	3.31	1.84	4.62	7	15.5
March	50.1	27.6	38.9	74	6	138	3.72	2.12	5.14	8	6.2
April	59.0	35.1	47.1	79	15	279	3.64	2.06	5.03	8	2.9
May	67.8	44.5	56.2	81	23	524	4.52	3.05	5.86	9	0.1
June	74.5	51.8	63.2	86	33	711	3.98	2.58	5.25	8	0.0
July	77.8	56.1	67.0	88	39	836	4.66	2.78	6.33	8	0.0
August	76.7	54.7	65.7	88	37	811	3.94	2.71	5.06	7	0.0
September	70.9	48.2	59.6	84	27	596	3.32	1.47	4.90	6	0.0
October	61.0	36.1	48.6	77	16	319	3.39	1.62	4.92	5	0.5
November	51.3	28.8	40.1	71	7	132	3.33	2.12	4.43	7	3.4
December	41.1	21.2	31.4	64	-7	52	3.31	1.825	4.63	6	8.9
Yearly:											
Average	59.0	36.6	47.9	---	---	---	---	---	---	---	---
Extreme	94	-26	---	89	-18	---	---	---	---	---	---
Total	---	---	---	---	---	4,461	44.33	38.87	49.61	86	52.5

* 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 1961-69 at Burkes Garden, 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—	May 8	May 17	June 4
2 years in 10 later than—	May 2	May 13	May 29
5 years in 10 later than—	Apr. 20	May 4	May 18
First freezing temperature in fall:			
1 year in 10 earlier than—	Oct. 2	Sept. 20	Sept. 12
2 years in 10 earlier than—	Oct. 7	Sept. 24	Sept. 16
5 years in 10 earlier than—	Oct. 16	Oct. 3	Oct. 25

Table 3.--Growing Season

(Recorded in the period 1961-69 at Burkes Garden, 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	156	135	110
8 years in 10	163	141	117
5 years in 10	178	151	130
2 years in 10	193	162	143
1 year in 10	200	167	150

Table 4.--Acreage and Proportionate Extent of the Soils, General Soil Map

Map symbol	General soil map unit name	Acres	Percent
1	Guernsey-Craigsville-Melvin association	15,503	4.8
2	Berks-Gilpin-Weikert association	39,098	12.0
3	Calvin-Alticrest-Wallen association	39,152	12.0
4	Chiswell-Litz-Groseclose association	3,027	0.9
5	Frederick-Carbo-Bland association	90,152	27.7
6	Madsheep-Paddyknob association	1,915	0.6
7	Westmoreland-Poplimento-Berks association	30,881	9.5
8	Oriskany-Murrill association	60,357	18.6
9	Cedarcreek-Alticrest-Grimsley association	7,538	2.3
10	Grimsley association	15,754	4.9
11	Lily association	18,280	5.6
12	Urban association	3,443	1.1
	Total	325,100	100.0

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1A	Allegheny loam, 0 to 2 percent slopes	129	*
1B	Allegheny loam, 2 to 7 percent slopes	349	0.1
2C	Alticrest fine sandy loam, 7 to 15 percent slopes	209	0.1
2D	Alticrest fine sandy loam, 15 to 25 percent slopes	1,624	0.5
2E	Alticrest fine sandy loam, 25 to 40 percent slopes	8,618	2.7
3C	Berks-Weikert complex, 7 to 15 percent slopes	373	0.1
3D	Berks-Weikert complex, 15 to 35 percent slopes	3,616	1.1
3E	Berks-Weikert complex, 35 to 55 percent slopes	18,661	5.7
4E	Berks-Gilpin complex, 25 to 35 percent slopes	4,359	1.3
4F	Berks-Gilpin complex, 35 to 70 percent slopes	9,663	3.0
5D	Bland-Rock outcrop complex, 15 to 25 percent slopes	419	0.1
5E	Bland-Rock outcrop complex, 25 to 50 percent slopes	4,673	1.4
6B	Bland silty clay loam, 2 to 7 percent slopes	112	*
6C	Bland silty clay loam, 7 to 15 percent slopes	340	0.1
6D	Bland silty clay loam, 15 to 25 percent slopes	475	0.1
7C	Botetourt loam, 7 to 15 percent slopes	4	*
8D	Brushy gravelly loam, 15 to 25 percent slopes	310	0.1
8E	Brushy gravelly loam, 25 to 60 percent slopes	1,722	0.5
9D	Calvin channery silt loam, 15 to 35 percent slopes	951	0.3
9E	Calvin channery silt loam, 35 to 55 percent slopes	5,235	1.6
10D	Calvin channery silt loam, 15 to 35 percent slopes, very stony	654	0.2
10E	Calvin channery silt loam, 35 to 55 percent slopes, very stony	4,197	1.3
11C	Carbo silt loam, 7 to 15 percent slopes	236	0.1
11D	Carbo silt loam, 15 to 25 percent slopes	188	0.1
11E	Carbo silt loam, 25 to 35 percent slopes	132	*
11F	Carbo silt loam, 35 to 65 percent slopes	650	0.2
12D	Carbo-Rock outcrop complex, 7 to 25 percent slopes	3,883	1.2
12E	Carbo-Rock outcrop complex, 25 to 65 percent slopes	18,454	5.7
13E	Carbo-Rock outcrop complex, karst, 7 to 65 percent slopes	7,852	2.4
14C	Cedarcreek-Alticrest-Rock outcrop complex, 5 to 15 percent slopes, very stony	98	*
14E	Cedarcreek-Alticrest-Rock outcrop complex, 15 to 40 percent slopes, very stony	1,508	0.5
15C	Cedarcreek-Rock outcrop complex, 0 to 15 percent slopes, very stony	715	0.2
15D	Cedarcreek-Rock outcrop complex, 15 to 35 percent slopes, very stony	124	*
15E	Cedarcreek-Rock outcrop complex, 35 to 80 percent slopes, very stony	885	0.3
16D	Chiswell-Litz complex, 15 to 25 percent slopes	340	0.1
16E	Chiswell-Litz complex, 25 to 35 percent slopes	1,007	0.3
16F	Chiswell-Litz complex, 35 to 60 percent slopes	1,184	0.4
17B	Coursey loam, 2 to 7 percent slopes	333	0.1
18B	Craigsville very gravelly sandy loam, 0 to 5 percent slopes, frequently flooded	2,515	0.8
19D	Drypond-Rock outcrop complex, 15 to 35 percent slopes, extremely stony	188	0.1
19E	Drypond-Rock outcrop complex, 35 to 80 percent slopes, extremely stony	37	*
20B	Frederick silt loam, 2 to 7 percent slopes	691	0.2
20C	Frederick silt loam, 7 to 15 percent slopes	2,389	0.7
20D	Frederick silt loam, 15 to 25 percent slopes	2,868	0.9
20E	Frederick silt loam, 25 to 35 percent slopes	1,362	0.4
20F	Frederick silt loam, 35 to 60 percent slopes	594	0.2
21B	Frederick gravelly silt loam, 2 to 7 percent slopes	665	0.2
21C	Frederick gravelly silt loam, 7 to 15 percent slopes	4,044	1.2
21D	Frederick gravelly silt loam, 15 to 25 percent slopes	10,786	3.3
21E	Frederick gravelly silt loam, 25 to 35 percent slopes	9,894	3.0
21F	Frederick gravelly silt loam, 35 to 60 percent slopes	3,325	1.0
22B	Frederick silt loam, karst, 2 to 7 percent slopes	592	0.2
22C	Frederick silt loam, karst, 7 to 15 percent slopes	4,460	1.4
22D	Frederick silt loam, karst, 15 to 25 percent slopes	4,534	1.4
22E	Frederick silt loam, karst, 25 to 35 percent slopes	407	0.1
23C	Gilpin-Berks complex, 7 to 15 percent slopes	675	0.2
23D	Gilpin-Berks complex, 15 to 25 percent slopes	1,749	0.5
24C	Grimsley loam, 8 to 15 percent slopes, very stony	30	*
24D	Grimsley loam, 15 to 35 percent slopes, very stony	2,157	0.7
24E	Grimsley loam, 35 to 70 percent slopes, very stony	13,559	4.2
25D	Grimsley-Cedarcreek-Berks complex, 8 to 35 percent slopes, very rocky	120	*
25E	Grimsley-Cedarcreek-Berks complex, 35 to 70 percent slopes, rocky	3,870	1.2
26B	Groseclose silt loam, 2 to 7 percent slopes	67	*

See footnote at end of table.

Table 5.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
26C	Groseclose silt loam, 7 to 15 percent slopes	80	*
26D	Groseclose silt loam, 15 to 25 percent slopes	223	0.1
26E	Groseclose silt loam, 25 to 35 percent slopes	127	*
27B	Guernsey silt loam, 2 to 7 percent slopes	2,545	0.8
27C	Guernsey silt loam, 7 to 15 percent slopes	398	0.1
28C	Lily fine sandy loam, 7 to 15 percent slopes	1,299	0.4
28D	Lily fine sandy loam, 15 to 25 percent slopes	2,502	0.8
28E	Lily fine sandy loam, 25 to 35 percent slopes	4,100	1.3
28F	Lily fine sandy loam, 35 to 65 percent slopes	10,375	3.2
29D	Lily fine sandy loam, 15 to 35 percent slopes, very stony	2,156	0.7
29E	Lily fine sandy loam, 35 to 65 percent slopes, very stony	4,844	1.5
30C	Madsheep channery silt loam, 7 to 15 percent slopes	11	*
30D	Madsheep channery silt loam, 15 to 35 percent slopes	70	*
31E	Madsheep channery silt loam, 35 to 55 percent slopes, very stony	763	0.2
32A	Melvin silt loam, 0 to 2 percent slopes, frequently flooded	1,980	0.6
33	Mine Tipples, Dumps, and Tailings	222	0.1
34B	Murrill silt loam, 2 to 7 percent slopes	703	0.2
34C	Murrill silt loam, 7 to 15 percent slopes	1,516	0.5
34D	Murrill silt loam, 15 to 25 percent slopes	619	0.2
35A	Newark-Lindside complex, 0 to 3 percent slopes, occasionally flooded	3,454	1.1
36F	Newbern-Rock outcrop complex, 25 to 70 percent slopes	909	0.3
37C	Oriskany gravelly fine sandy loam, 7 to 15 percent slopes	2,863	0.9
37D	Oriskany gravelly fine sandy loam, 15 to 25 percent slopes	1,664	0.5
38C	Oriskany gravelly fine sandy loam, 7 to 15 percent slopes, very stony	3,301	1.0
38D	Oriskany gravelly fine sandy loam, 15 to 35 percent slopes, very stony	29,212	9.0
38E	Oriskany gravelly fine sandy loam, 35 to 55 percent slopes, extremely stony	20,434	6.3
39D	Paddyknob-Rock outcrop complex, 15 to 35 percent slopes, extremely stony	158	*
39E	Paddyknob-Rock outcrop complex, 35 to 80 percent slopes, extremely stony	269	0.1
40D	Paddyknob gravelly loam, 15 to 35 percent slopes, very stony	464	0.1
40E	Paddyknob gravelly loam, 35 to 55 percent slopes, very stony	180	*
41A	Philo fine sandy loam, 0 to 3 percent slopes, frequently flooded	1,316	0.4
42B	Pisgah silt loam, 2 to 7 percent slopes	819	0.3
42C	Pisgah silt loam, 7 to 15 percent slopes	150	*
43B	Pisgah silt loam, karst, 2 to 7 percent slopes	968	0.3
43C	Pisgah silt loam, karst, 7 to 15 percent slopes	118	*
44	Pits, quarry	212	0.1
45A	Pope fine sandy loam, 0 to 2 percent slopes, rarely flooded	1,231	0.4
46C	Poplimento-Westmoreland complex, 7 to 15 percent slopes	1,241	0.4
46D	Poplimento-Westmoreland complex, 15 to 25 percent slopes	2,812	0.9
47A	Purdy silt loam, 0 to 2 percent slopes	362	0.1
48B	Timberville silt loam, 2 to 7 percent slopes, frequently flooded	938	0.3
49B	Tumbling loam, 2 to 7 percent slopes, very stony	9	*
49C	Tumbling loam, 7 to 15 percent slopes, very stony	4	*
50	Udorthents-Urban land complex	3,444	1.1
51D	Wallen-Rock outcrop complex, 15 to 35 percent slopes, extremely stony	869	0.3
51E	Wallen-Rock outcrop complex, 35 to 80 percent slopes, extremely stony	5,148	1.6
52C	Wallen channery sandy loam, 7 to 15 percent slopes, very stony	326	0.1
52D	Wallen channery sandy loam, 15 to 35 percent slopes, very stony	2,170	0.7
52E	Wallen channery sandy loam, 35 to 65 percent slopes, very stony	1,945	0.6
53E	Westmoreland-Poplimento-Berks complex, 25 to 35 percent slopes	7,091	2.2
53F	Westmoreland-Poplimento-Berks complex, 35 to 65 percent slopes	19,731	6.0
54A	Wolfgap clay loam, 0 to 2 percent slopes, occasionally flooded	2	*
	Water	893	0.3
	Total	325,100	100.0

* Less than 0.1 percent.

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	Soil name
1A	Allegheny loam, 0 to 2 percent slopes
1B	Allegheny loam, 2 to 7 percent slopes
17B	Coursey loam, 2 to 7 percent slopes
20B	Frederick silt loam, 2 to 7 percent slopes
21B	Frederick gravelly silt loam, 2 to 7 percent slopes
22B	Frederick silt loam, karst, 2 to 7 percent slopes
26B	Groseclose silt loam, 2 to 7 percent slopes
27B	Guernsey silt loam, 2 to 7 percent slopes
32A	Melvin silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not subject to frequent flooding during the growing season)
34B	Murrill silt loam, 2 to 7 percent slopes
35A	Newark-Lindside complex, 0 to 3 percent slopes, occasionally flooded (where drained and either protected from flooding or not subject to frequent flooding during the growing season)
41A	Philo fine sandy loam, 0 to 3 percent slopes, frequently flooded (where protected from flooding or not subject to frequent flooding during the growing season)
42B	Pisgah silt loam, 2 to 7 percent slopes
43B	Pisgah silt loam, karst, 2 to 7 percent slopes
45A	Pope fine sandy loam, 0 to 2 percent slopes, rarely flooded
47A	Purdy silt loam, 0 to 2 percent slopes (where drained)
48B	Timberville silt loam, 2 to 7 percent slopes, frequently flooded (where protected from flooding or not subject to frequent flooding during the growing season)
54A	Wolfgap clay loam, 0 to 2 percent slopes, occasionally flooded

Table 7.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Corn silage	Grass-legume hay	Alfalfa hay	Pasture	Tobacco
		Bu	Tons	Tons	Tons	AUM*	Lbs
1A--Allegheny	I	120	24.0	3.5	4.5	8.5	---
1B--Allegheny	IIe	120	24.0	3.5	4.5	8.5	---
2C--Alticrest	IIIe	70	---	---	---	5.5	1,800
2D--Alticrest	VIe	---	---	---	---	4.5	---
2E--Alticrest	VIIe	---	---	---	---	---	---
3C--Berks-Weikert	IVe	67	---	2.3	2.6	4.9	---
3D--Berks-Weikert	VIe	---	---	---	---	---	---
3E--Berks-Weikert	VIIe	---	---	---	---	---	---
4E, 4F--Berks-Gilpin	VIIe	---	---	---	---	---	---
5D**--Bland-Rock outcrop	VIIs	---	---	---	---	---	---
5E**--Bland-Rock outcrop	VIIs	---	---	---	---	---	---
6B--Bland	IIIe	75	15.0	3.5	---	6.0	---
6C--Bland	IVe	75	15.0	3.0	---	5.0	---
6D--Bland	VIe	---	---	2.5	---	4.5	---
7C--Botetourt 8D, 8E. Brushy	IIIe	85	19.0	2.5	---	7.0	---
9D, 9E--Calvin	VIIe	---	---	---	---	---	---
10D, 10E--Calvin	VIIs	---	---	---	---	---	---

See footnotes at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Grass-legume hay	Alfalfa hay	Pasture	Tobacco
		Bu	Tons	Tons	Tons	AUM*	Lbs
11C---------- Carbo	IIIe	80	17.0	3.0	4.0	---	---
11D---------- Carbo	VIe	---	---	---	---	---	---
11E, 11F-------- Carbo	VIIe	---	---	---	---	---	---
12D**---------- Carbo-Rock outcrop	VIIs	---	---	---	---	---	---
12E**, 13E**---- Carbo-Rock outcrop	VIIs	---	---	---	---	---	---
14C**---------- Cedarcreek- Alticrest- Rock outcrop	VIIs	---	---	---	---	---	---
14E**---------- Cedarcreek- Alticrest- Rock outcrop	VIIs	---	---	---	---	---	---
15C**---------- Cedarcreek- Rock outcrop	VIIs	---	---	---	---	---	---
15D**, 15E**---- Cedarcreek- Rock outcrop	VIIs	---	---	---	---	---	---
16D---------- Chiswell-Litz	VIe	---	---	1.7	---	3.2	---
16E---------- Chiswell-Litz	VIIe	---	---	---	---	---	---
16F---------- Chiswell-Litz	VIIe	---	---	---	---	---	---
17B---------- Coursey	IIe	110	22.0	3.0	---	6.0	---
18B---------- Craigsville	IIIw	75	13.0	1.8	2.0	---	---
19D**, 19E**---- Drypond-Rock outcrop	VIIs	---	---	---	---	---	---
20B---------- Frederick	IIe	130	26.0	3.5	4.5	8.3	---
20C---------- Frederick	IIIe	120	24.0	3.0	4.5	8.0	---

See footnotes at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Grass-legume hay	Alfalfa hay	Pasture	Tobacco
		Bu	Tons	Tons	Tons	AUM*	Lbs
20D---------- Frederick	IVe	80	16.0	3.0	4.0	7.7	---
20E---------- Frederick	VIe	---	---	---	---	7.0	---
20F---------- Frederick	VIIe	---	---	---	---	---	---
21B---------- Frederick	IIe	105	21.0	3.5	4.5	8.3	---
21C---------- Frederick	IIIe	100	20.0	3.0	4.5	8.0	---
21D---------- Frederick	IVe	80	16.0	3.0	4.0	7.7	---
21E---------- Frederick	VIe	---	---	---	---	7.0	---
21F---------- Frederick	VIIe	---	---	---	---	---	---
22B---------- Frederick	IIe	130	26.0	3.5	4.5	8.3	---
22C---------- Frederick	IIIe	120	24.0	3.0	4.5	8.0	---
22D---------- Frederick	IVe	80	16.0	3.0	4.0	7.7	---
22E---------- Frederick	VIe	---	---	---	---	7.0	---
23C---------- Gilpin-Berks	IIIe	81	16.2	2.8	3.3	6.4	---
23D---------- Gilpin-Berks	IVe	---	---	---	---	---	---
24C---------- Grimsley	VIs	---	---	---	---	---	---
24D, 24E-------- Grimsley	VIIs	---	---	---	---	---	---
25D---------- Grimsley-Cedarcreek-Berks	VIIs	---	---	---	---	---	---
25E---------- Grimsley-Cedarcreek-Berks	VIIs	---	---	---	---	---	---
26B---------- Groseclose	IIe	125	20.0	3.7	4.0	8.2	---

See footnotes at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Grass-legume hay	Alfalfa hay	Pasture	Tobacco
		Bu	Tons	Tons	Tons	AUM*	Lbs
26C---------- Groseclose	IIIe	110	18.0	3.2	3.5	7.5	---
26D---------- Groseclose	IVe	80	---	3.0	3.0	6.5	---
26E---------- Groseclose	VIe	---	---	---	---	6.0	---
27B---------- Guernsey	IIe	100	---	---	---	---	---
27C---------- Guernsey	IIIe	90	---	---	---	---	---
28C---------- Lily	IIIe	85	17.0	3.0	---	6.0	2,400
28D---------- Lily	VIe	---	---	---	---	4.5	---
28E, 28F-------- Lily	VIIe	---	---	---	---	---	---
29D---------- Lily	VIs	---	---	---	---	4.5	---
29E---------- Lily	VIIs	---	---	---	---	---	---
30C---------- Madsheep	IIIe	---	---	---	---	6.0	---
30D---------- Madsheep	VIe	---	---	---	---	---	---
31E---------- Madsheep	VIIe	---	---	---	---	---	---
32A---------- Melvin	IIIw	75	14.0	3.0	---	6.5	---
33**---------- Mine dumps	VIIIs	---	---	---	---	---	---
34B---------- Murrill	IIe	120	24.0	3.5	4.5	8.5	---
34C---------- Murrill	IIIe	110	22.0	3.0	4.0	7.5	---
34D---------- Murrill	IVe	95	19.0	3.0	4.0	7.5	---
35A---------- Newark-Lindside	IIw	118	---	4.1	---	---	2,650
36F**---------- Newbern-Rock outcrop	VIII	---	---	---	---	---	---

See footnotes at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Grass-legume hay	Alfalfa hay	Pasture	Tobacco
		Bu	Tons	Tons	Tons	AUM*	Lbs
37C---------- Oriskany	IIIe	---	---	2.0	---	4.0	---
37D---------- Oriskany	IVe	---	---	1.8	---	3.5	---
38C---------- Oriskany	VIs	---	---	---	---	4.0	---
38D, 38E----- Oriskany	VIIs	---	---	---	---	---	---
39D**-------- Paddyknob-Rock outcrop	VIIs	---	---	---	---	---	---
39E**-------- Paddyknob-Rock outcrop	VIIs	---	---	---	---	---	---
40D---------- Paddyknob	VIIs	---	---	---	---	---	---
40E---------- Paddyknob	VIIe	---	---	---	---	---	---
41A---------- Philo	IIw	130	---	3.5	4.5	8.5	---
42B---------- Pisgah	IIe	125	25.0	3.5	---	6.0	---
42C---------- Pisgah	IIIe	120	24.0	3.0	---	6.0	---
43B---------- Pisgah	IIe	125	25.0	3.5	---	6.0	---
43C---------- Pisgah	IIIe	120	24.0	3.0	---	6.0	---
44**--------- Pits	VIIIs	---	---	---	---	---	---
45A---------- Pope	I	130	---	4.0	---	8.0	3,000
46C---------- Poplimento-Westmoreland	IIIe	109	23.0	3.0	4.2	7.8	---
46D---------- Poplimento-Westmoreland	IVe	100	20.6	3.0	4.0	7.6	---
47A---------- Purdy	IVw	80	16.0	2.5	---	---	---
48B---------- Timberville	IIe	125	25.0	4.0	4.5	8.5	2,500

See footnotes at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Grass-legume hay	Alfalfa hay	Pasture	Tobacco
		Bu	Tons	Tons	Tons	AUM*	Lbs
49B, 49C--------Tumbling	VIs	---	---	---	---	6.5	---
50**------------Udorthents-Urban land	---	---	---	---	---	---	---
51D**, 51E**----Wallen-Rock outcrop	VIIs	---	---	---	---	---	---
52C, 52D, 52E---Wallen	VIIs	---	---	---	---	---	---
53E-------------Westmoreland-Poplimento-Berks	VIIe	---	---	---	---	---	---
53F-------------Westmoreland-Poplimento-Berks	VIIe	---	---	---	---	---	---
54A-------------Wolfgap	I	130	25.0	4.0	4.5	---	3,100

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
1A, 1B---------- Allegheny	9A	Slight	Slight	Slight	Moderate	Shortleaf pine------	80	9	Eastern white pine, yellow-poplar, black walnut, white oak, white ash, northern red oak.
						Yellow-poplar-------	93	7	
						Virginia pine-------	72	8	
						Sugar maple---------	---	---	
						White ash-----------	---	---	
						Northern red oak----	---	---	
						American elm--------	---	---	
						Red maple-----------	---	---	
						Pignut hickory------	---	---	
						Black oak-----------	78	4	
						White oak-----------	70	4	
						Eastern redcedar----	---	---	
						Black cherry--------	---	---	
2C---------- Alticrest	6R	Slight	Moderate	Slight	Moderate	Virginia pine-------	60	6	Eastern white pine.
						Shortleaf pine------	60	6	
						Chestnut oak--------	---	---	
2D, 2E---------- Alticrest	6R	Moderate	Moderate	Slight	Moderate	Virginia pine-------	60	6	Eastern white pine.
						Shortleaf pine------	60	6	
						Chestnut oak--------	---	---	
3C**: Berks----------	4F	Slight	Slight	Moderate	Moderate	Northern red oak----	70	4	Eastern white pine, Japanese larch, Norway spruce.
						Black oak-----------	70	4	
						Virginia pine-------	70	8	
						Chestnut oak--------	---	---	
						Scarlet oak---------	---	---	
Weikert--------	3D	Slight	Slight	Severe	Moderate	Northern red oak----	59	3	Eastern white pine.
						Virginia pine-------	56	6	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
3D**: Berks----------	4F	Slight	Moderate	Moderate	Moderate	Northern red oak----	70	4	Eastern white pine, Japanese larch, Norway spruce.
						Black oak-----------	70	4	
						Virginia pine-------	70	8	
						Chestnut oak--------	---	---	
						Scarlet oak---------	---	---	
Weikert--------	3D	Slight	Moderate	Severe	Moderate	Northern red oak----	64	3	Eastern white pine.
						Virginia pine-------	60	6	
						Chestnut oak--------	---	---	
						Scarlet oak---------	---	---	
3E**: Berks----------	4R	Moderate	Severe	Moderate	Moderate	Northern red oak----	70	4	Eastern white pine, Japanese larch, Norway spruce.
						Black oak-----------	70	4	
						Virginia pine-------	70	8	
						Chestnut oak--------	---	---	
						Scarlet oak---------	---	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
3E**:									
Weikert	3R	Moderate	Severe	Severe	Moderate	Northern red oak	64	3	Eastern white pine, shortleaf pine, Virginia pine.
						Virginia pine	60	6	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
4E,4F**:									
Berks	4R	Moderate	Severe	Moderate	Moderate	Northern red oak	70	4	Eastern white pine, Japanese larch.
						Black oak	70	4	
						Virginia pine	70	8	
						Chestnut oak	---	---	
Gilpin	4R	Severe	Severe	Slight	Moderate	Northern red oak	80	4	Japanese larch, eastern white pine, black cherry, yellow-poplar.
						Yellow-poplar	95	7	
5D**:									
Bland	4C	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	4	Eastern white pine, yellow-poplar.
						Yellow-poplar	76	4	
						Virginia pine	70	8	
						Eastern red cedar	---	---	
Rock outcrop.									
5E**:									
Bland	4R	Severe	Severe	Moderate	Moderate	Northern red oak	70	4	Eastern white pine, yellow-poplar.
						Yellow-poplar	76	4	
						Virginia pine	70	8	
						Eastern red cedar	---	---	
Rock outcrop.									
6B, 6C	4C	Slight	Slight	Moderate	Moderate	Northern red oak	70	4	Eastern white pine, yellow-poplar.
Bland						Yellow-poplar	76	4	
						Virginia pine	70	8	
						Eastern red cedar	---	---	
6D	4C	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	4	Eastern white pine, yellow-poplar.
Bland						Yellow-poplar	76	4	
						Virginia pine	70	8	
						Eastern red cedar	---	---	
7C	4A	Slight	Slight	Slight	Moderate	Northern red oak	75	4	Eastern white pine, yellow-poplar, shortleaf pine.
Botetourt						Virginia pine	65	7	
						Yellow-poplar	95	7	
8D	4R	Slight	Moderate	Slight	Moderate	Northern red oak	75	4	Eastern white pine, European larch, Norway spruce, black locust.
Brushy						Chestnut oak	85	6	
8E	4R	Moderate	Severe	Slight	Moderate	Northern red oak	75	4	Eastern white pine, European larch, Norway spruce, black locust.
Brushy						Chestnut oak	---	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
9D---------- Calvin	5F	Slight	Moderate	Moderate	Severe	Northern red oak---- Chestnut oak-------- Red maple----------	80 77 ---	5 4 ---	Eastern white pine.
9E---------- Calvin	5R	Moderate	Severe	Moderate	Severe	Northern red oak---- Chestnut oak-------- Red maple----------	80 77 ---	5 4 ---	Eastern white pine.
10D---------- Calvin	5F	Slight	Moderate	Moderate	Severe	Northern red oak---- Chestnut oak-------- Scarlet oak--------- Red maple----------	80 77 --- ---	5 4 --- ---	Eastern white pine.
10E---------- Calvin	5R	Moderate	Severe	Moderate	Severe	Northern red oak---- Chestnut oak-------- Scarlet oak--------- Red maple----------	77 77 --- ---	4 4 --- ---	Eastern white pine.
11C---------- Carbo	4C	Slight	Moderate	Slight	Moderate	Northern red oak---- Virginia pine------- Eastern red cedar---	70 55 ---	4 6 ---	Eastern white pine, black walnut.
11D, 11E-------- Carbo	4R	Moderate	Moderate	Slight	Moderate	Northern red oak---- Virginia pine------- Eastern red cedar---	70 55 ---	4 5 ---	Yellow-poplar, eastern white pine.
11F---------- Carbo	4R	Severe	Severe	Slight	Moderate	Eastern red cedar--- Northern red oak---- Virginia pine	--- --- ---	--- --- ---	Yellow-poplar, eastern white pine.
12D**: Carbo----------	4R	Moderate	Moderate	Slight	Moderate	Northern red oak---- Virginia pine------- Eastern red cedar---	70 55 ---	4 5 ---	Yellow-poplar, eastern white pine.
Rock outcrop.									
12E**: Carbo----------	4R	Severe	Severe	Slight	Moderate	Eastern red cedar--- Northern red oak---- Virginia pine-------	--- --- ---	--- --- ---	Yellow-poplar, eastern white pine.
Rock outcrop.									
13E**: Carbo----------	4R	Severe	Severe	Slight	Moderate	Eastern red cedar--- Northern red oak---- Virginia pine------- Hickory----------	--- --- --- ---	--- --- --- ---	Yellow-poplar, eastern white pine.
Rock outcrop.									

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
14C**:									
Cedarcreek-----	4X	Slight	Slight	Severe	Moderate	Northern red oak----	80	4	Eastern white pine, Virginia pine, shortleaf pine, black locust, American sycamore. black alden, bristly locust.
						Eastern white pine--	94	12	
						Yellow-poplar-------	105	8	
						American sycamore---	90	7	
						Black locust--------	---	---	
						Red maple-----------	---	---	
Alticrest------	6R	Slight	Moderate	Slight	Moderate	Virginia pine-------	60	6	Eastern white pine.
						Shortleaf pine------	60	6	
						Chestnut oak--------	---	---	
Rock outcrop.									
14E**:									
Cedarcreek-----	4R	Moderate	Moderate	Severe	Moderate	Northern red oak----	80	4	Eastern white pine, Virginia pine, black alder, shortleaf pine, black locust, brisly locust, American sycamore.
						Eastern white pine--	94	12	
						American sycamore---	90	7	
						Black locust--------	---	---	
						Red maple-----------	---	---	
Alticrest.									
Rock outcrop.									
15C**:									
Cedarcreek-----	4X	Slight	Slight	Severe	Moderate	Northern red oak----	80	4	Eastern white pine, Virginia pine, black alder, shortleaf pine, black locust, bristly locust, American sycamore.
						Eastern white pine--	94	12	
						American sycamore---	90	7	
						Black locust--------	---	---	
						Northern red oak----	---	---	
						Red maple-----------	---	---	
Rock outcrop.									

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
15D**:									
Cedarcreek-----	4R	Moderate	Moderate	Severe	Moderate	Northern red oak----	80	4	Eastern white pine, Virginia pine, black alder, shortleaf pine, black locust, bristly locust, American sycamore.
						Eastern white pine--	94	12	
						American sycamore---	90	7	
						Black locust--------	---	---	
						Northern red oak----	---	---	
						Red maple-----------	---	---	
Rock outcrop.									
15E**:									
Cedarcreek-----	4R	Severe	Severe	Severe	Moderate	Northern red oak----	80	4	Eastern white pine, Virginia pine, black alder, shortleaf pine, black locust, bristly locust, American sycamore.
						Eastern white pine--	94	12	
						American sycamore---	90	7	
						Black locust--------	---	---	
						Northern red oak----	---	---	
						Red maple-----------	---	---	
Rock outcrop.									
16D**, 16E**:									
Chiswell-------	4R	Moderate	Moderate	Moderate	Moderate	Northern red oak----	74	4	Eastern white pine.
						Virginia pine-------	61	6	
						Chestnut oak--------	---	---	
Litz-----------	4F	Slight	Moderate	Moderate	--------	Northern red oak----	80	4	Eastern white pine.
						Virginia pine-------	65	7	
						Chestnut oak--------	---	---	
16F**:									
Chiswell-------	4R	Severe	Severe	Moderate	Moderate	Northern red oak----	74	4	Eastern white pine.
						Virginia pine-------	61	6	
						Chestnut oak--------	---	---	
Litz-----------	4R	Moderate	Severe	Moderate	--------	Northern red oak----	80	4	Eastern white pine.
						Virginia pine-------	65	7	
						Chestnut oak--------	95	7	
17B------------	4A	Slight	Slight	Slight	Moderate	Northern red oak----	70	4	Eastern white pine, yellow-poplar.
Coursey						Virginia pine-------	60	6	
						Yellow-poplar-------	90	6	
18B------------	4F	Slight	Slight	Moderate	Moderate	Northern red oak----	80	4	Eastern white pine, yellow-poplar.
Craigsville						Yellow-poplar-------	95	7	
						Eastern white pine--	90	12	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
19D**:									
Drypond	3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	55	3	Eastern white pine.
						Virginia pine	45	4	
Rock outcrop.									
19E**:									
Drypond	3R	Severe	Severe	Moderate	Moderate	Northern red oak	55	3	Eastern white pine.
						Virginia pine	45	4	
Rock outcrop.									
20B, 20C	4C	Slight	Moderate	Slight	Moderate	Northern red oak	76	4	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
Frederick						Yellow-poplar	86	6	
						Black locust	80	4	
						White oak	76	4	
						Black walnut	76	4	
						Eastern red cedar	---	---	
20D, 20E	4R	Moderate	Moderate	Slight	Moderate	Northern red oak	76	4	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
Frederick						Yellow-poplar	86	6	
						Black locust	80	4	
						White oak	76	4	
						Black walnut	76	4	
						Eastern red cedar	---	---	
20F	4R	Severe	Severe	Slight	Moderate	Northern red oak	76	4	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
Frederick						Yellow-poplar	86	6	
						Black locust	80	4	
						White oak	76	4	
						Black walnut	76	4	
						Eastern red cedar	---	---	
21B, 21C	4C	Slight	Moderate	Moderate	Moderate	Northern red oak	76	4	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
Frederick						Yellow-poplar	86	6	
						Black locust	80	4	
						White oak	76	4	
						Black walnut	76	4	
						Eastern red cedar	---	---	
21D, 21E	4S	Moderate	Moderate	Moderate	Moderate	Northern red oak	76	4	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
Frederick						Yellow-poplar	86	6	
						Black locust	80	4	
						White oak	76	4	
						Black walnut	76	4	
						Eastern red cedar	---	---	
21F	4R	Severe	Severe	Moderate	Moderate	Northern red oak	76	4	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
Frederick						Yellow-poplar	86	6	
						Black locust	80	4	
						White oak	76	4	
						Black walnut	76	4	
						Eastern red cedar	---	---	
22B, 22C	4C	Slight	Moderate	Slight	Moderate	Northern red oak	76	4	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
Frederick						Yellow-poplar	86	6	
						Black locust	80	4	
						White oak	76	4	
						Black walnut	76	4	
						Eastern red cedar	---	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
22D, 22E-------- Frederick	4R	Moderate	Moderate	Slight	Moderate	Northern red oak---- Yellow-poplar------- Black locust-------- White oak----------- Black walnut-------- Eastern red cedar---	76 86 80 76 76 ---	4 6 4 4 4 ---	Eastern white pine, yellow-poplar, black walnut, Scotch pine.
23C**: Gilpin--------- Berks---------- 	4A 4F 	Slight Slight 	Slight Slight 	Slight Moderate 	Moderate Moderate 	Northern red oak---- Yellow-poplar------- White oak----------- Northern red oak---- Black oak----------- Virginia pine------- Chestnut oak-------- 	80 95 --- 70 70 70 --- 	4 7 --- 4 4 8 --- 	Japanese larch, eastern white pine, black cherry, yellow-poplar. Eastern white pine, Japanese larch.
23D**: Gilpin. Berks---------- 	4A 4F 	Slight Slight 	Slight Moderate 	Slight Moderate 	Moderate Moderate 	Northern red oak---- Yellow-poplar------- White oak----------- Northern red oak---- Black oak----------- Virginia pine------- Chestnut oak-------- 	80 95 --- 70 70 70 --- 	4 7 --- 4 4 8 --- 	Japanese larch, eastern white pine, black cherry, yellow-poplar. Eastern white pine, Japanese larch.
24C, 24D-------- Grimsley	6X	Slight	Moderate	Slight	Moderate	Yellow-poplar------- Southern red oak---- Northern red oak---- Red maple-----------	90 75 --- ---	6 4 --- ---	Yellow-poplar, shortleaf pine, eastern white pine.
24E------------- Grimsley	6R	Moderate	Severe	Slight	Moderate	Yellow-poplar------- Southern red oak---- Northern red oak---- Red maple-----------	90 75 --- ---	6 4 --- ---	Yellow-poplar, eastern white pine.
25D**: Grimsley------- 	6X 	Slight 	Moderate 	Slight 	Moderate 	Yellow-poplar------- Southern red oak---- Northern red oak---- Red maple-----------	90 75 70 ---	6 4 8 ---	Yellow-poplar, eastern white pine.

See footnotes at end of table

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
25D**:									
Cedarcreek-----	4R	Moderate	Moderate	Severe	Moderate	Northern red oak	80	4	Eastern white pine, Virginia pine, black alder, shortleaf pine, black locust, bristly locust, American sycamore.
						Eastern white pine	94	12	
						American sycamore	90	7	
						Black locust	---	---	
						Red maple	---	---	
Berks----------	4F	Slight	Moderate	Moderate	---	Northern red oak	70	4	Virginia pine, eastern white pine, Japanese larch.
						Black oak	70	4	
						Virginia pine	70	8	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
25E**:									
Grimsley-------	6R	Moderate	Severe	Slight	Moderate	Yellow-poplar	90	6	Yellow-poplar, eastern white pine.
						Southern red oak	75	4	
						Northern red oak	70	8	
						Red maple	---	---	
Cedarcreek-----	4R	Severe	Severe	Severe	Moderate	Northern red oak	80	4	Eastern white pine, Virginia pine, black alder, shortleaf pine, black locust, bristly locust, American sycamore.
						Eastern white pine	94	12	
						American sycamore	90	7	
						Black locust	---	---	
						Red maple	---	---	
Berks----------	4R	Moderate	Severe	Moderate	---	Northern red oak	70	4	Virginia pine, eastern white pine, Japanese larch.
						Black oak	70	4	
						Virginia pine	70	8	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
26B, 26C-------- Groseclose	5A	Slight	Slight	Slight	Moderate	Northern red oak	85	5	Eastern white pine, yellow-poplar.
						White oak	85	5	
						Yellow-poplar	86	6	
26D, 26E-------- Groseclose	5R	Moderate	Moderate	Moderate	Moderate	Northern red oak	85	5	Eastern white pine, yellow-poplar.
						Yellow-poplar	86	6	
						White oak	85	5	
27B, 27C-------- Guernsey	4A	Slight	Slight	Slight	Severe	Northern red oak	78	4	Eastern white pine, yellow-poplar, green ash, white ash, white oak, northern red oak.
						Yellow-poplar	95	7	
						Sugar maple	---	---	
						White ash	---	---	
						White oak	---	---	
						Black cherry	---	---	
						Red maple	---	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
28C---------- Lily	7A	Slight	Moderate	Slight	Moderate	Shortleaf pine------	63	7	Eastern white pine.
						Virginia pine-------	80	8	
						Black oak-----------	78	---	
						White oak-----------	73	4	
						Chestnut oak--------	73	---	
						Northern red oak----	78	---	
						Scarlet oak---------	77	3	
28D---------- Lily	7R	Moderate	Moderate	Slight	Moderate	Shortleaf pine------	63	7	Eastern white pine.
						Virginia pine-------	80	8	
						Black oak-----------	78	---	
						White oak-----------	73	4	
						Chestnut oak--------	73	---	
						Northern red oak----	78	---	
						Scarlet oak---------	77	3	
28E, 28F-------- Lily	6R	Severe	Severe	Moderate	Moderate	Shortleaf pine------	57	---	Eastern white pine.
						Virginia pine-------	71	---	
						Scarlet oak---------	66	---	
						White oak-----------	67	---	
						Chestnut oak--------	---	---	
29D---------- Lily	3R	Moderate	Moderate	Slight	Slight	Southern red oak----	65	3	Eastern white pine.
						Scarlet oak---------	64	3	
						Chestnut oak--------	74	4	
29E---------- Lily	3R	Severe	Severe	Slight	Slight	Southern red oak----	65	3	
						Scarlet oak---------	64	3	
						Chestnut oak--------	74	4	
30C---------- Madsheep	4F	Slight	Slight	Slight	Moderate	Black cherry--------	80	4	Black cherry, red pine, Norway spruce, Eastern white pine.
						Red maple-----------	---	---	
						Red spruce----------	73	10	
						Northern red oak----	76	4	
						Yellow birch--------	---	---	
						Black birch---------	---	---	
30D---------- Madsheep	4F	Moderate	Moderate	Slight	Moderate	Black cherry--------	80	4	Black cherry, red pine, Norway spruce, eastern white pine.
						Red maple-----------	---	---	
						Red spruce----------	78	10	
						Northern red oak----	76	4	
						Yellow birch--------	---	---	
						Black birch---------	---	---	
31E---------- Madsheep	4R	Severe	Severe	Slight	Moderate	Black cherry--------	80	4	Black cherry, red pine, Norway spruce, eastern white pine.
						Red maple-----------	---	---	
						Red spruce----------	73	10	
						Northern red oak----	76	4	
						Yellow birch--------	---	---	
						Black birch---------	---	---	
32A---------- Melvin	7W	Slight	Moderate	Moderate	Severe	Green ash-----------	---	---	Pin oak, American sycamore, sweetgum, eastern cottonwood, willow oak, black willow.
						Hackberry-----------	---	---	
						Hickory-------------	---	---	
						Red maple-----------	---	---	
						American elm--------	---	---	
						Cherrybark oak------	91	8	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
34B, 34C--Murrill	4A	Slight	Slight	Slight	Moderate	Northern red oak	72	4	Eastern white pine, yellow-poplar, black walnut, Norway spruce, Japanese larch.
						Yellow-poplar	94	7	
						White ash	70	5	
						Eastern white pine	80	10	
						Black walnut	---	---	
34D--Murrill	4R	Slight	Moderate	Slight	Moderate	Northern red oak	72	4	Eastern white pine, yellow-poplar, black walnut, Norway spruce, Japanese larch.
						Yellow-poplar	94	7	
						White ash	70	5	
						Eastern white pine	80	10	
						Black walnut	---	---	
35A**:									
Newark	5W	Slight	Moderate	Slight	Severe	Northern red oak	86	5	Eastern cottonwood, sweetgum, American sycamore.
						Yellow-poplar	95	7	
						Black walnut	---	---	
						White ash	85	4	
						White oak	85	5	
						Red maple	---	---	
						Sycamore	---	---	
Lindside	5A	Slight	Slight	Slight	Severe	Northern red oak	86	5	Northern red oak, yellow-poplar, black walnut, white ash, white oak, eastern white pine, Norway spruce, Japanese larch, black oak.
						Yellow-poplar	95	7	
						Black walnut	---	---	
						White ash	85	4	
						White oak	85	5	
						Red maple	---	---	
						Sycamore	---	---	
36F**:									
Newbern	3R	Severe	Severe	Severe	Moderate	Scarlet oak	65	3	Eastern white pine.
						Chestnut oak	65	7	
Rock outcrop.									
37C--Oriskany	4F	Slight	Slight	Moderate	Slight	Northern red oak	75	4	Yellow-poplar, northern red oak, white oak, black walnut, eastern white pine.
						White oak	75	4	
						Yellow-poplar	95	7	
						Red maple	---	---	
						Sugar maple	---	---	
37D--Oriskany	4F	Moderate	Moderate	Moderate	Slight	Northern red oak	75	4	Yellow-poplar, northern red oak, white oak, black walnut, eastern white pine.
						White oak	75	4	
						Yellow-poplar	95	7	
						Red maple	---	---	
						Sugar maple	---	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
38C---------- Oriskany	4F	Slight	Moderate	Moderate	Slight	Northern red oak----	70	4	Eastern white pine, yellow-poplar, black walnut, Norway spruce, Japanese larch, eastern white pine.
						White oak----------	70	4	
						Eastern white pine--	80	10	
						Yellow-poplar-------	75	4	
						Black walnut--------	---	---	
						Red maple----------	---	---	
						Sugar maple---------	---	---	
38D---------- Oriskany	4F	Moderate	Moderate	Moderate	Slight	Northern red oak----	70	4	Eastern white pine, yellow-poplar, black walnut, Norway spruce, Japanese larch, eastern white pine.
						White oak----------	70	4	
						Eastern white pine--	80	10	
						Yellow-poplar-------	75	4	
						Black walnut--------	---	---	
						Red maple----------	---	---	
						Sugar maple---------	---	---	
38E---------- Oriskany	4R	Severe	Severe	Moderate	Slight	Northern red oak----	70	4	Eastern white pine, yellow-poplar, black walnut, Norway spruce, Japanese larch. eastern white pine.
						White oak----------	70	4	
						Eastern white pine--	80	10	
						Yellow-poplar-------	75	4	
						Black walnut--------	---	---	
						Red maple----------	---	---	
						Sugar maple---------	---	---	
39D**:									
Paddyknob------	4F	Slight	Moderate	Moderate	Moderate	Black cherry--------	72	4	Black cherry, red pine, Norway spruce, eastern white pine.
						Red maple----------	---	---	
						Red spruce---------	60	10	
						Northern red oak----	55	3	
						Yellow birch--------	---	---	
						Black birch---------	---	---	
Rock outcrop									
39E**:									
Paddyknob------	4R	Severe	Severe	Slight	Moderate	Black cherry--------	72	4	Black cherry, red pine, Norway spruce, eastern white pine.
						Red maple----------	---	---	
						Red spruce---------	60	10	
						Northern red oak----	55	3	
						Yellow birch--------	---	---	
						Black birch---------	---	---	
Rock outcrop.									
40D---------- Paddyknob	4F	Slight	Moderate	Moderate	Moderate	Black cherry--------	72	4	Black cherry, red pine, Norway spruce, eastern white pine.
						Red maple----------	---	---	
						Red spruce---------	60	10	
						Northern red oak----	55	3	
						Yellow birch--------	---	---	
						Black birch---------	---	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
40E---------- Paddyknob	4R	Severe	Severe	Slight	Moderate	Black cherry--------	72	4	Black cherry, red pine, Norway spruce, eastern white pine.
						Red maple----------	---	---	
						Red spruce----------	60	10	
						Northern red oak----	55	3	
						Yellow birch--------	---	---	
						Black birch---------	---	---	
41A---------- Philo	4A	Slight	Slight	Slight	Severe	Northern red oak----	86	5	Eastern white pine, yellow-poplar.
						Yellow-poplar-------	102	8	
						Black oak----------	85	5	
						White oak----------	85	5	
						White ash----------	85	8	
42B---------- Pisgah	5A	Slight	Slight	Slight	Severe	Northern red oak----	86	5	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	7	
						Sugar maple---------	---	---	
						American basswood---	---	---	
42C---------- Pisgah	5R	Moderate	Slight	Slight	Severe	Northern red oak----	86	5	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	7	
						Sugar maple---------	---	---	
						American basswood---	---	---	
43B---------- Pisgah	5A	Slight	Slight	Slight	Severe	Northern red oak----	86	5	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	7	
						Sugar maple---------	---	---	
						American basswood---	---	---	
43C---------- Pisgah	5R	Moderate	Slight	Slight	Severe	Northern red oak----	86	5	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	7	
						Sugar maple---------	---	---	
						American basswood---	---	---	
45A---------- Pope	7A	Slight	Slight	Slight	Severe	Yellow-poplar-------	96	7	Eastern white pine, yellow-poplar, black walnut, white oak, northern red oak, white ash.
						American beech------	---	---	
						White oak----------	80	4	
						Blackgum-----------	---	---	
						American sycamore---	---	---	
						Northern red oak----	---	---	
						American basswood---	---	---	
						Eastern hemlock-----	---	---	
						Bitternut hickory---	---	---	
46C**:									
Poplimento-----	4C	Slight	Moderate	Slight	Slight	Northern red oak----	80	4	Eastern white pine, yellow-poplar, black walnut.
						Yellow-poplar-------	90	6	
						Hickory------------	---	---	
						Black walnut--------	---	---	
						Ash-----------------	---	---	
Westmoreland---	4A	Slight	Slight	Slight	Severe	Northern red oak----	75	4	Eastern white pine, yellow-poplar, Virginia pine.
						Yellow-poplar-------	85	6	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
46D**:									
Poplimento	4R	Moderate	Severe	Slight	Slight	Northern red oak	80	4	Eastern white pine, yellow-poplar, black walnut.
						Yellow-poplar	90	6	
						Hickory	---	---	
						Black walnut	---	---	
						Ash	---	---	
Westmoreland	4R	Moderate	Moderate	Slight	Severe	Northern red oak	81	4	Black walnut, yellow-poplar, eastern white pine.
						Yellow-poplar	90	6	
47A---Purdy	4W	Slight	Severe	Severe	Severe	Shortleaf pine	75	8	Pine oak, American sycamore, sweetgum, eastern cottonwood, willow oak, black willow.
						Virginia pine	75	8	
						Yellow-poplar	90	6	
48B---Timberville	5A	Slight	Slight	Slight	Severe	Yellow-poplar	80	5	Yellow-poplar, black walnut, eastern white pine.
						Northern red oak	90	5	
						Eastern red cedar			
49B---Tumbling	4X	Slight	Moderate	Slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow-poplar.
						Yellow-poplar	90	6	
						Eastern white pine	80	10	
49C---Tumbling	4X	Moderate	Moderate	Slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow-poplar.
						Yellow-poplar	90	6	
						Eastern white pine	80	10	
51D**:									
Wallen	3R	Slight	Moderate	Moderate	Slight	Northern red oak	60	3	Eastern white pine.
						Shortleaf pine	60	6	
						Virginia pine	65	7	
						Chestnut oak	---	---	
						Pitch pine	---	---	
Rock outcrop.									
51E**:									
Wallen	3R	Moderate	Severe	Moderate	Slight	Northern red oak	60	3	Eastern white pine.
						Shortleaf pine	60	6	
						Virginia pine	65	7	
						Chestnut oak	---	---	
						Pitch pine	---	---	
Rock outcrop.									
52C---Wallen	3F	Slight	Slight	Moderate	Slight	Northern red oak	60	3	Eastern white pine.
						Shortleaf pine	60	6	
						Virginia pine	65	7	
						Chestnut oak	---	---	
						Scarlet oak	---	---	

See footnotes at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
52D---------- Wallen	3R	Slight	Moderate	Moderate	Slight	Northern red oak----	60	3	Eastern white pine.
						Shortleaf pine------	60	6	
						Virginia pine-------	65	7	
						Chestnut oak--------	---	---	
						Scarlet oak---------	---	---	
52E---------- Wallen	3R	Moderate	Severe	Moderate	Slight	Northern red oak----	60	3	Eastern white pine.
						Shortleaf pine------	60	6	
						Virginia pine-------	65	7	
						Chestnut oak--------	---	---	
						Scarlet oak---------	---	---	
53E**:									
Westmoreland---	4R	Moderate	Moderate	Slight	Severe	Northern red oak----	81	4	Black walnut, yellow-poplar, eastern white pine.
						Yellow-poplar-------	90	6	
Poplimento-----	4R	Moderate	Severe	Slight	Slight	Northern red oak----	80	4	Eastern white pine, yellow-poplar, black walnut.
						Yellow-poplar-------	90	6	
						Hickory-------------	---	---	
						Black walnut--------	---	---	
						Ash-----------------	---	---	
Berks----------	4F	Slight	Moderate	Moderate	Moderate	Northern red oak----	70	4	Eastern white pine, Japanese larch, Norway spruce.
						Black oak-----------	70	4	
						Virginia pine-------	70	8	
						Chestnut oak--------	---	---	
53F**:									
Westmoreland---	4R	Severe	Severe	Slight	Severe	Northern red oak----	81	4	Black walnut, yellow-poplar, eastern white pine.
						Yellow-poplar-------	90	6	
							75	10	
Poplimento-----	4R	Severe	Severe	Slight	Slight	Northern red oak----	80	4	Eastern white pine, yellow-poplar, black walnut.
						Yellow-poplar-------	90	6	
						Hickory-------------	---	---	
						Black walnut--------	---	---	
						Ash-----------------	---	---	
Berks----------	4F	Slight	Moderate	Moderate	Moderate	Northern red oak----	70	4	Eastern white pine, Japanese larch, Norway spruce.
						Black oak-----------	70	4	
						Virginia pine-------	70	8	
						Chestnut oak--------	---	---	
54A---------- Wolfgap	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	96	7	Eastern white pine, yellow-poplar, black walnut, white oak, northern red oak, white ash, shortleaf pine.
						American beech------	---	---	
						White oak-----------	80	4	
						Blackgum------------	---	---	
						American sycamore---	---	---	
						Northern red oak----	---	---	
						American basswood---	---	---	
						Eastern hemlock-----	---	---	
						Bitternut hickory---	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 9.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1A Allegheny	Slight	Slight	Moderate: small stones.	Slight	Slight.
1B Allegheny	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
2C Alticrest	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
2D Alticrest	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
2E Alticrest	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
3C*: Berks	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.
Weikert	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones.	Slight	Severe: droughty, depth to rock.
3D*, 3E*: Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Weikert	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe	Severe: droughty, depth to rock.
4E*: Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Gilpin	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
4F*: Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
5D*: Bland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
5D*:					
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
5E*:					
Bland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
6B	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, depth to rock.	Severe: erodes easily.	Moderate: depth to rock.
6C	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, depth to rock.
6D	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
7C	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Moderate: wetness.	Moderate: wetness, droughty, slope.
8D	Severe: slope, small stones, percs slowly.	Severe: slope, small stones, percs slowly.	Severe: slope, small stones, percs slowly.	Moderate: slope.	Severe: small stones, slope.
8E	Severe: slope, small stones, percs slowly.	Severe: slope, small stones, percs slowly.	Severe: slope, small stones, percs slowly.	Severe: slope.	Severe: small stones, slope.
9D, 9E	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
10D, 10E	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
11C	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, depth to rock.
11D	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
11E, 11F	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
12D*:					
Carbo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
12E*, 13E*:					
Carbo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
14C*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Alticrest	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
Rock outcrop	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
14E*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Alticrest	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
15C*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Rock outcrop	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
15D*, 15E*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
16D*:					
Chiswell	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.
Litz	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones.	Severe: small stones, slope.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
16E*, 16F*:					
Chiswell	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: depth to rock, slope.
Litz	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
17B Coursey	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Slight	Slight.
18B Craigsville	Severe: flooding, small stones.	Severe: small stones.	Severe: small stones, flooding.	Moderate: flooding.	Severe: small stones, flooding.
19D*, 19E*:					
Drypond	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, droughty, slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
20B Frederick	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
20C Frederick	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
20D Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
20E, 20F Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
21B Frederick	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, large stones.
21C Frederick	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.
21D Frederick	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
21E, 21F Frederick	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
22B Frederick	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
22C---------- Frederick	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
22D---------- Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
22E---------- Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
23C*:					
Gilpin----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, thin layer.
Berks----------	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight----------	Severe: small stones.
23D*:					
Gilpin----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Berks----------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
24C---------- Grimsley	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones.	Severe: large stones.
24D, 24E---------- Grimsley	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: large stones, slope.
25D*:					
Grimsley----------	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: large stones, slope.
Cedarcreek----------	Variable--------	Variable--------	Variable--------	Variable--------	Variable.
Berks----------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: small stones, slope.
25E*:					
Grimsley----------	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: large stones, slope.
Cedarcreek----------	Variable--------	Variable--------	Variable--------	Variable--------	Variable.
Berks----------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
26B	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
Groseclose					
26C	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Groseclose					
26D	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Groseclose					
26E	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Groseclose					
27B	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
Guernsey					
27C	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, wetness.
Guernsey					
28C	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
Lily					
28D, 28E, 28F	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lily					
29D, 29E	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.	Severe: slope.
Lily					
30C	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty.
Madsheep					
30D	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Madsheep					
31E	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Madsheep					
32A	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Melvin					
33*	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: large stones, slope, small stones.	Severe: small stones, large stones, droughty.
Mine Tipples, Dumps, and Tailings					

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
34B Murrill	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
34C Murrill	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
34D Murrill	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
35A*: Newark	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Lindside	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
36F*: Newbern	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
37C Oriskany	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Severe: droughty.
37D Oriskany	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
38C Oriskany	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: large stones, droughty.
38D, 38E Oriskany	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: large stones, slope.	Severe: large stones, droughty, slope.
39D*, 39E*: Paddyknob	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
40D, 40E Paddyknob	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
41A Philo	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
42B Pisgah	Slight	Slight	Moderate: slope.	Slight	Slight.
42C Pisgah	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
43B Pisgah	Slight	Slight	Moderate: slope.	Slight	Slight.
43C Pisgah	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
44* Pits	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
45A Pope	Severe: flooding.	Slight	Moderate: small stones.	Slight	Slight.
46C*: Poplimento	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Westmoreland	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
46D*: Poplimento	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Westmoreland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
47A Purdy	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
48B Timberville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
49B Tumbling	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.
49C Tumbling	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
50*: Udorthents.					
Urban land	Variable	Variable	Variable	Variable	Variable.

See footnote at end of table.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
51D*, 51E*:					
Wallen	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: too acid, slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
52C					
Wallen	Severe: too acid.	Severe: too acid.	Severe: large stones, slope, small stones.	Slight	Severe: too acid.
52D, 52E					
Wallen	Severe: slope, too acid.	Severe: slope, too acid.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: too acid, slope.
53E*, 53F*:					
Westmoreland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Poplimento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
54A					
Wolfgap	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Slight	Moderate: droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1A---Allegheny	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
1B---Allegheny	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
2C---Alticrest	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
2D---Alticrest	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
2E---Alticrest	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
3C*:										
Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
3D*:										
Berks	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
3E*:										
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
4E*, 4F*:										
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Gilpin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
5D*:										
Bland	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
5E*:										
Bland	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
6B---- Bland	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
6C---- Bland	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
6D---- Bland	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
7C---- Botetourt	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
8D---- Brushy	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
8E---- Brushy	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
9D---- Calvin	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
9E, 10D---- Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
10E---- Calvin	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
11C---- Carbo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
11D---- Carbo	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
11E---- Carbo	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
11F---- Carbo	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
12D*:										
Carbo----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
12E*, 13E*:										
Carbo----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
14C*:										
Cedarcreek----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Alticrest----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
14C*:										
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
14E*:										
Cedarcreek	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Alticrest	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
15C*, 15D*, 15E*:										
Cedarcreek	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
16D*:										
Chiswell	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Litz	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
16E*:										
Chiswell	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Litz	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
16F*:										
Chiswell	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Litz	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
17B--Coursey	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
18B--Craigsville	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
19D*:										
Drypond	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
19E*:										
Drypond	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
19E*:										
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
20B---- Frederick	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
20C---- Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
20D---- Frederick	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
20E, 20F---- Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
21B---- Frederick	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
21C---- Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
21D---- Frederick	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
21E, 21F---- Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
22B---- Frederick	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
22C---- Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
22D---- Frederick	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
22E---- Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
23C*:										
Gilpin----	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Berks----	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
23D*:										
Gilpin----	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Berks----	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
24C---- Grimsley	Poor	Poor	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
24D, 24E---- Grimsley	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
25D*, 25E*:										
Grimsley	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Cedarcreek	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
26B Groseclose	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
26C Groseclose	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
26D Groseclose	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
26E Groseclose	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
27B Guernsey	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
27C Guernsey	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
28C Lily	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
28D Lily	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
28E, 28F, 29D Lily	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
29E Lily	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
30C Madsheep	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
30D Madsheep	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
31E Madsheep	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
32A Melvin	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
33* Mine Tipples, Dumps, and Tailings	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
34B Murrill	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
34C---Murrill	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
34D---Murrill	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
35A*:										
Newark	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Lindside	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
36F*:										
Newbern	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
37C---Oriskany	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
37D---Oriskany	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
38C, 38D, 38E---Oriskany	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
39D*, 39E*:										
Paddyknob	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
40D, 40E---Paddyknob	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
41A---Philo	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
42B---Pisgah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
42C---Pisgah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
43B---Pisgah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
43C---Pisgah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
44*---Pits	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
45A---Pope	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
46C*:										
Poplimento	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Westmoreland	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
46D*:										
Poplimento	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Westmoreland	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
47A---------- Purdy	Poor	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
48B---------- Timberville	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
49B---------- Tumbling	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.
49C---------- Tumbling	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.
50*:										
Udorthents.										
Urban land.										
51D*, 51E*:										
Wallen	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
52C, 52D, 52E------ Wallen	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
53E*:										
Westmoreland	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Poplimento	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Berks	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
53F*:										
Westmoreland	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Poplimento	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
54A---------- Wolfgap	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1A Allegheny	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
1B Allegheny	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
2C Alticrest	Severe: depth to rock, cutbanks cave.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Moderate: slope, depth to rock.
2D, 2E Alticrest	Severe: depth to rock, cutbanks cave, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
3C*: Berks	Moderate: depth to rock, large stones, slope.	Moderate: slope, large stones.	Moderate: depth to rock, slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
Weikert	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: droughty, depth to rock.
3D*, 3E*: Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Weikert	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, depth to rock.
4E*, 4F*: Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
5D*, 5E*: Bland	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
6B Bland	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: low strength.	Moderate: depth to rock.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
6C Bland	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
6D Bland	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
7C Botetourt	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: wetness, droughty, slope.
8D, 8E Brushy	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
9D, 9E, 10D, 10E Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
11C Carbo	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope, depth to rock.
11D, 11E, 11F Carbo	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
12D*, 12E*, 13E*: Carbo	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
14C*: Cedarcreek	Variable	Variable	Variable	Variable	Variable	Variable.
Alticrest	Severe: depth to rock, cutbanks cave.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Moderate: slope, depth to rock.
Rock outcrop	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
14E*: Cedarcreek	Variable	Variable	Variable	Variable	Variable	Variable.
Alticrest	Severe: depth to rock, cutbanks cave, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
15C*:						
Cedarcreek	Variable	Variable	Variable	Variable	Variable	Variable.
Rock outcrop	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
15D*, 15E*:						
Cedarcreek	Variable	Variable	Variable	Variable	Variable	Variable.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
16D*, 16E*, 16F*:						
Chiswell	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.
Litz	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
17B Coursey	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Slight.
18B Craigsville	Severe: cutbanks cave, large stones.	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: small stones, flooding.
19D*, 19E*:						
Drypond	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: small stones, droughty, slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
20B Frederick	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
20C Frederick	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: slope, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: slope.
20D, 20E, 20F Frederick	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: shrink-swell, low strength, slope.	Severe: slope.
21B Frederick	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: small stones, large stones.
21C Frederick	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope, small stones.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
21D, 21E, 21F----- Frederick	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
22B---------- Frederick	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
22C---------- Frederick	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: slope, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: slope.
22D, 22E---------- Frederick	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: shrink-swell, low strength, slope.	Severe: slope.
23C*:						
Gilpin----------	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, thin layer.
Berks----------	Moderate: depth to rock, large stones, slope.	Moderate: slope, large stones.	Moderate: depth to rock, slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
23D*:						
Gilpin----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Berks----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
24C---------- Grimsley	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: large stones.
24D, 24E---------- Grimsley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
25D*, 25E*:						
Grimsley----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
Cedarcreek-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Berks----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
26B---------- Groseclose	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
26C---------- Groseclose	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
26D, 26E---------- Groseclose	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
27B---------- Guernsey	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
27C---------- Guernsey	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: slope, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: slope, wetness.
28C---------- Lily	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Moderate: slope, depth to rock.
28D, 28E, 28F, 29D, 29E--------- Lily	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
30C---------- Madsheep	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: small stones, droughty.
30D, 31E---------- Madsheep	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
32A---------- Melvin	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
33*---------- Mine Tipples, Dmps, and Tailings	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: small stones, large stones, droughty.
34B---------- Murrill	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength, frost action.	Slight.
34C---------- Murrill	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
34D---------- Murrill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
35A*: Newark----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
35A*:						
Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
36F*:						
Newbern	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
37C----------						
Oriskany	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Severe: droughty.
37D----------						
Oriskany	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
38C----------						
Oriskany	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones, droughty.
38D, 38E----------						
Oriskany	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, droughty, slope.
39D*, 39E*:						
Paddyknob	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
40D, 40E----------						
Paddyknob	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
41A----------						
Philo	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
42B----------						
Pisgah	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
42C----------						
Pisgah	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
43B Pisgah	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
43C Pisgah	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
44* Pits	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
45A Pope	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
46C*: Poplimento	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
Westmoreland	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
46D*: Poplimento	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Westmoreland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
47A Purdy	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
48B Timberville	Moderate: too clayey.	Slight	Moderate: shrink-swell.	Slight	Moderate: frost action.	Slight.
49B Tumbling	Moderate: too clayey, large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: small stones, large stones, slope.
49C Tumbling	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
50*: Udorthents.						
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
51D*, 51E*: Wallen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: too acid, slope.

See footnote at end of table.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
51D*, 51E*:						
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
52C						
Wallen	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, large stones.	Severe: too acid.
52D, 52E						
Wallen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: too acid, slope.
53E*, 53F*:						
Westmoreland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Poplimento	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
54A						
Wolfgap	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--General Corrective Measures for Limitations for Dwellings With or Without Basements

(Consult the office of the local building inspector for specific requirements)

Limiting factors	Corrective measures
Depth to soft bedrock	Excavate bedrock with machinery.
Depth to hard bedrock	Remove bedrock by blasting.
Flooding	Dwellings with or without basements are not recommended uses.
Large stones	Remove stones.
Shrinking and swelling	Maintain constant moisture; strengthen the foundation.
Slope	Design dwelling placement parallel to the slope.
Wetness	Provide surface and subsurface drainage to remove water from the foundation.

Table 13.--General Corrective Measures for Limitations for Lawns and Landscaping

(Consult the local office of the Cooperative Extension Service for specific requirements)

Limiting factors	Corrective measures
Depth to bedrock	Select and plant shallow-rooted plant materials in built-up beds.
Flooding	Lawns and landscaping are not recommended uses.
Large stones	Excavate and remove stones.
Small stones	Screen and remove stones.
Droughty	Maintain adequate moisture for selected plant species.
Slope	Design and landscape to minimize runoff and maintenance.
Wetness	Provide surface and subsurface drainage to remove excess water.

Table 14.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1A, 1B Allegheny	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey, thin layer.
2C Alticrest	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.
2D, 2E Alticrest	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
3C*: Berks	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
Weikert	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, seepage, small stones.
3D*, 3E*: Berks	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Weikert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, seepage, small stones.
4E*, 4F*: Berks	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Gilpin	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: slope, area reclaim, thin layer.
5D*, 5E*: Bland	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
5D*, 5E*:					
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
6B	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
6C	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
6D	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
7C	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Poor: small stones.
8D, 8E	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, seepage, small stones.
9D, 9E, 10D, 10E	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
11C	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
11D, 11E, 11F	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
12D*, 12E*, 13E*:					
Carbo	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
14C*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Alticrest	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
14C*:					
Rock outcrop	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
14E*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Alticrest	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
15C*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Rock outcrop	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
15D*, 15E*:					
Cedarcreek	Variable	Variable	Variable	Variable	Variable.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
16D*, 16E*, 16F*:					
Chiswell	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Litz	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
17B	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: small stones.
Coursey					
18B	Severe: flooding, poor filter, large stones.	Severe: seepage, flooding, large stones.	Severe: flooding, seepage, large stones.	Severe: flooding, seepage.	Poor: seepage, large stones.
Craigsville					
19D*, 19E*:					
Drypond	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
20B Frederick	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
20C Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
20D, 20E, 20F Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
21B Frederick	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
21C Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
21D, 21E, 21F Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
22B Frederick	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
22C Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
22D, 22E Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
23C*:					
Gilpin	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
Berks	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
23D*:					
Gilpin	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: slope, area reclaim, thin layer.
Berks	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
24C---------- Grimsley	Moderate: depth to rock, slope, large stones.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
24D, 24E---------- Grimsley	Severe: slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
25D*, 25E*: Grimsley----------	Severe: slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Cedarcreek---------	Variable---------	Variable---------	Variable---------	Variable---------	Variable.
Berks----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
26B---------- Groseclose	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
26C---------- Groseclose	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
26D, 26E---------- Groseclose	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
27B---------- Guernsey	Severe: wetness, percs slowly.	Severe: wetness.	Severe: seepage, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
27C---------- Guernsey	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: seepage, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
28C---------- Lily	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.
28D, 28E, 28F------- Lily	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
29D, 29E---------- Lily	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
30C Madsheep	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
30D, 31E Madsheep	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
32A Melvin	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
33* Mine Tipples, Dumps, and Tailings	Severe: poor filter, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, small stones, large stones.
34B Murrill	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Poor: small stones.
34C Murrill	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Poor: small stones.
34D Murrill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
35A*:					
Newark	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Lindside	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
36F*:					
Newbern	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
37C Oriskany	Moderate: percs slowly, slope, large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Moderate: slope.	Poor: small stones.
37D Oriskany	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: slope.	Poor: small stones, slope.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
38C---Oriskany	Severe: large stones.	Severe: seepage, slope, large stones.	Severe: seepage, large stones.	Moderate: slope.	Poor: large stones.
38D, 38E---Oriskany	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: slope.	Poor: large stones, slope.
39D*, 39E*:					
Paddyknob	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
40D, 40E---Paddyknob	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
41A---Philo	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, depth to rock, seepage.	Severe: flooding, wetness.	Fair: depth to rock, small stones, wetness.
42B---Pisgah	Moderate: depth to rock, percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Slight	Poor: too clayey, hard to pack.
42C---Pisgah	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
43B---Pisgah	Moderate: depth to rock, percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Slight	Poor: too clayey, hard to pack.
43C---Pisgah	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
44*---Pits	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
45A---Pope	Moderate: flooding, percs slowly.	Severe: seepage, flooding.	Severe: seepage.	Severe: seepage.	Good.
46C*:					
Poplimento	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
46C*:					
Westmoreland	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Poor: small stones.
46D*:					
Poplimento	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Westmoreland	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: small stones, slope.
47A	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
48B	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack, small stones.
49B	Moderate: percs slowly, slope, large stones.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: large stones.
49C	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope.	Poor: large stones, slope.
50*:					
Udorthents.					
Urban land	Variable	Variable	Variable	Variable	Variable.
51D*, 51E*:					
Wallen	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
52C	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
52D, 52E	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

Table 14.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
53E*, 53F*:					
Westmoreland	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: small stones, slope.
Poplimento	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Berks	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
54A Wolfgap	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: too clayey, small stones, thin layer.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--General Corrective Measures for Limitations for Septic Tank Absorption Fields

(Consult the local office of the Cooperative Extension Service for specific requirements)

Limiting factors	Corrective measures
Depth to bedrock	Use a special design.
Flooding	Septic tank absorption fields are not recommended uses.
Large stones	Remove the stones.
Percs slowly	Enlarge the absorption field.
Poor filter	Enlarge the absorption field.
Slope	Lay out the absorption field on the contour.
Wetness	Provide surface and subsurface drainage; use a special design.

Table 16.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1A, 1B Allegheny	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
2C Alticrest	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
2D Alticrest	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
2E Alticrest	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
3C*: Berks	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones.
3D*, 3E*: Berks	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Weikert	Poor: depth to rock, slope.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
4E*, 4F*: Berks	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Gilpin	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
5D*: Bland	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Rock outcrop	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
5E*:				
Bland	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
6B, 6C				
Bland	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
6D				
Bland	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
7C				
Botetourt	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
8D				
Brushy	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones, slope.
8E				
Brushy	Poor: depth to rock, slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones, slope.
9D, 9E, 10D, 10E				
Calvin	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
11C				
Carbo	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
11D, 11E, 11F				
Carbo	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
12D*:				
Carbo	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
12E*, 13E*:				
Carbo	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
12E*, 13E*:				
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
14C*:				
Cedarcreek	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Alticrest	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Rock outcrop	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
14E*:				
Cedarcreek	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Alticrest	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
15C*:				
Cedarcreek	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Rock outcrop	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
15D*, 15E*:				
Cedarcreek	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
16D*:				
Chiswell	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Litz	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
16E*, 16F*:				
Chiswell	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Litz	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
17B				
Coursey	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
18B				
Craigsville	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim.
19D*, 19E*:				
Drypond	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
20B, 20C				
Frederick	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
20D				
Frederick	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
20E, 20F				
Frederick	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
21B, 21C				
Frederick	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
21D				
Frederick	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
21E, 21F				
Frederick	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
22B, 22C				
Frederick	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
22D---------- Frederick	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
22E---------- Frederick	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
23C*:				
Gilpin----------	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Berks----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
23D*:				
Gilpin----------	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Berks----------	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
24C---------- Grimsley	Fair: depth to rock, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
24D, 24E---------- Grimsley	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
25D*:				
Grimsley----------	Fair: depth to rock, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Cedarcreek----------	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Berks----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
25E*:				
Grimsley----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Cedarcreek----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
25E*:				
Berks	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
26B, 26C	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
26D	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
26E	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
27B, 27C	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey.
28C	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
28D, 28E, 28F	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
29D, 29E	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
30C	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
30D, 31E	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
32A	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
33*	Poor: large stones, slope.	Improbable: small stones, large stones.	Improbable: large stones.	Poor: large stones, small stones, area reclaim.
34B, 34C	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
34D	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
35A*:				
Newark	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Lindside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.
36F*:				
Newbern	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
37C---------- Oriskany	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
37D---------- Oriskany	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
38C---------- Oriskany	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim.
38D, 38E---------- Oriskany	Poor: large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
39D*, 39E*:				
Paddyknob	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
40D, 40E---------- Paddyknob	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
41A---------- Philo	Fair: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
42B, 42C, 43B, 43C---- Pisgah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, thin layer.
44*---------- Pits	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
45A Pope	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
46C*:				
Poplimento	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Westmoreland	Fair: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
46D*:				
Poplimento	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Westmoreland	Fair: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
47A Purdy	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
48B Timberville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
49B Tumbling	Fair: low strength, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones, area reclaim.
49C Tumbling	Fair: low strength, large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones, area reclaim.
50*:				
Udorthents.				
Urban land	Variable	Variable	Variable	Variable.
51D*, 51E*:				
Wallen	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, too acid, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
52C Wallen	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, too acid.

See footnote at end of table.

Table 16.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
52D, 52E---------- Wallen	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, too acid, slope.
53E*, 53F*: Westmoreland---------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Poplimento----------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Berks----------	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
54A---------- Wolfgap	Good----------	Probable----------	Improbable: too sandy.	Poor: small stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--	
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
1A---------- Allegheny	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
1B---------- Allegheny	Moderate: seepage, slope.	Severe: piping.	Deep to water	Favorable	Favorable.
2C, 2D, 2E-------- Alticrest	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
3C*, 3D*, 3E*:					
Berks----------	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Weikert----------	Severe: depth to rock, slope.	Severe: seepage.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
4E*, 4F*:					
Berks----------	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Gilpin----------	Severe: slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
5D*, 5E*:					
Bland----------	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Slight----------	Deep to water	Slope, depth to rock.	Slope, depth to rock.
6B---------- Bland	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Depth to rock, erodes easily.	Erodes easily, depth to rock.
6C, 6D---------- Bland	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
7C---------- Botetourt	Severe: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness.	Slope, droughty.
8D, 8E---------- Brushy	Severe: slope.	Severe: seepage, piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.

See footnote at end of table.

Table 17.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
9D, 9E, 10D, 10E--Calvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
11C, 11D, 11E, 11F--Carbo	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
12D*, 12E*, 13E*:					
Carbo	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Rock outcrop	Severe: depth to rock, slope.	Slight	Deep to water	Slope, depth to rock.	Slope, depth to rock.
14C*, 14E*:					
Cedarcreek	Severe: seepage, slope.	Moderate: large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
Alticrest	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
Rock outcrop	Severe: depth to rock, slope.	Slight	Deep to water	Slope, depth to rock.	Slope, depth to rock.
15C*:					
Cedarcreek	Severe: seepage.	Moderate: large stones.	Deep to water	Large stones	Large stones, droughty.
Rock outcrop	Severe: depth to rock.	Slight	Deep to water	Depth to rock	Depth to rock.
15D*, 15E*:					
Cedarcreek	Severe: seepage, slope.	Moderate: large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
Rock outcrop	Severe: depth to rock, slope.	Slight	Deep to water	Slope, depth to rock.	Slope, depth to rock.
16D*, 16E*, 16F*:					
Chiswell	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, large stones.	Large stones, slope, erodes easily.
Litz	Severe: slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
17B--Coursey	Moderate: seepage, slope.	Severe: piping.	Frost action, slope.	Wetness	Favorable.

See footnote at end of table.

Table 17.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
18B---------- Craigsville	Severe: seepage.	Severe: seepage, large stones.	Deep to water	Large stones, too sandy.	Large stones, droughty.
19D*, 19E*:					
Drypond----------	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop-----	Severe: depth to rock, slope.	Slight----------	Deep to water	Slope, depth to rock.	Slope, depth to rock.
20B---------- Frederick	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Favorable--------	Favorable.
20C, 20D, 20E, 20F---------- Frederick	Severe: slope.	Severe: hard to pack.	Deep to water	Slope----------	Slope.
21B---------- Frederick	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Favorable--------	Favorable.
21C, 21D, 21E, 21F---------- Frederick	Severe: slope.	Severe: hard to pack.	Deep to water	Slope----------	Slope.
22B---------- Frederick	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Favorable--------	Favorable.
22C, 22D, 22E----- Frederick	Severe: slope.	Severe: hard to pack.	Deep to water	Slope----------	Slope.
23C*, 23D*:					
Gilpin----------	Severe: slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Berks----------	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
24C, 24D, 24E----- Grimsley	Severe: seepage, slope.	Severe: large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
25D*, 25E*:					
Grimsley----------	Severe: seepage, slope.	Severe: large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
Cedarcreek-------	Severe: seepage, slope.	Moderate: large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.

See footnote at end of table.

Table 17.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
25D*, 25E*: Berks	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
26B Groseclose	Moderate: slope.	Severe: hard to pack.	Deep to water	Erodes easily, percs slowly.	Erodes easily, percs slowly.
26C, 26D, 26E Groseclose	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
27B Guernsey	Moderate: seepage, slope.	Severe: hard to pack.	Percs slowly, slope, frost action.	Erodes easily, wetness.	Erodes easily, percs slowly.
27C Guernsey	Severe: slope.	Severe: hard to pack.	Percs slowly, slope, frost action.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
28C Lily	Severe: seepage.	Severe: piping.	Deep to water	Slope	Slope, depth to rock.
28D, 28E, 28F Lily	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope, depth to rock.
29D, 29E Lily	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
30C, 30D Madsheep	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, droughty.
31E Madsheep	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
32A Melvin	Moderate: seepage.	Severe: piping, wetness.	Flooding	Erodes easily, wetness.	Wetness, erodes easily.
33* Mine Tipples, Dumps, and Tailings	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
34B Murrill	Moderate: seepage, slope.	Severe: piping.	Deep to water	Favorable	Favorable.
34C, 34D Murrill	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope.
35A*: Newark	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Erodes easily, wetness.	Wetness, erodes easily.

See footnote at end of table.

Table 17.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
35A*:					
Lindside	Severe: seepage.	Severe: piping, wetness.	Flooding, frost action.	Erodes easily, wetness.	Erodes easily.
36F*:					
Newbern	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop	Severe: depth to rock, slope.	Slight	Deep to water	Slope, depth to rock.	Slope, depth to rock.
37C, 37D					
Oriskany	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
38C, 38D, 38E					
Oriskany	Severe: seepage, slope.	Severe: piping, large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
39D*, 39E*:					
Paddyknob	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop	Severe: depth to rock, slope.	Slight	Deep to water	Slope, depth to rock.	Slope, depth to rock.
40D, 40E					
Paddyknob	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
41A					
Philo	Severe: seepage.	Severe: piping, wetness.	Flooding	Wetness	Favorable.
42B					
Pisgah	Severe: seepage.	Severe: hard to pack.	Deep to water	Erodes easily	Erodes easily.
42C					
Pisgah	Severe: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
43B					
Pisgah	Severe: seepage.	Severe: hard to pack.	Deep to water	Erodes easily	Erodes easily.
43C					
Pisgah	Severe: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
44*					
Pits	Severe: depth to rock, slope.	Slight	Deep to water	Slope, depth to rock.	Slope, depth to rock.
45A					
Pope	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.

See footnote at end of table.

Table 17.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
46C*, 46D*:					
Poplimento	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope.
Westmoreland	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope.
47A Purdy	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly, frost action.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
48B Timberville	Moderate: seepage, slope.	Moderate: piping, hard to pack.	Deep to water	Favorable	Favorable.
49B, 49C Tumbling	Severe: slope.	Severe: large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
50*:					
Udorthents.					
Urban land	Variable	Variable	Variable	Variable	Variable.
51D*, 51E*:					
Wallen	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop	Severe: depth to rock, slope.	Slight	Deep to water	Slope, depth to rock.	Slope, depth to rock.
52C, 52D, 52E Wallen	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
53E*, 53F*:					
Westmoreland	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope.
Poplimento	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope.
Berks	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
54A Wolfgap	Severe: seepage.	Severe: piping.	Deep to water	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 18.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
1A, 1B----------	0-11	Loam----------	ML	A-4	0	90-100	85-100	65-100	55-95	<35	NP-10
Allegheny	11-32	Clay loam, loam, sandy clay loam.	ML, CL, SM, SC	A-4, A-6	0	90-100	85-100	65-95	35-80	<35	NP-15
	32-61	Gravelly sandy loam, very gravelly sand, gravelly sandy clay loam.	GC, SC, GW-GC, SW-SC	A-1, A-2, A-4, A-6	0-30	30-65	20-55	15-50	10-40	<35	NP-15
2C, 2D, 2E-------	0-3	Fine sandy loam--	ML, CL-ML, SM, SC-SM	A-4, A-2	0-2	80-100	75-100	55-80	34-65	<20	NP-6
Alticrest	3-35	Sandy loam, loam, fine sandy loam.	ML, CL-ML, SM, SC-SM	A-4, A-2	0-2	80-100	75-100	55-85	34-70	<23	NP-6
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
3C*, 3D*, 3E*:											
Berks----------	0-6	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	6-24	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	24-33	Channery loam, very channery loam, extremely channery silt loam.	GM, SM, GM-GC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	33	Weathered bedrock	---	---	---	---	---	---	---	---	---
Weikert---------	0-7	Channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0-10	35-70	35-70	25-65	20-55	30-40	4-10
	7-19	Shaly loam, very shaly silt loam, cherty loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	19	Weathered bedrock	---	---	---	---	---	---	---	---	---
4E*:											
Berks----------	0-4	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	4-14	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	14-33	Channery loam, very channery loam, very channery silt loam.	GM, SM, GM-GC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	33	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
4E*:											
Gilpin	0-6	Channery silt loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-90	45-85	35-75	30-70	20-40	4-15
	6-30	Channery loam, shaly silt loam, silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	30-35	Channery loam, very channery silt loam, very shaly silty clay loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4F*:											
Berks	0-4	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	4-14	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	14-33	Channery loam, very channery loam, very channery silt loam.	GM, SM, GM-GC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	33	Weathered bedrock	---	---	---	---	---	---	---	---	---
Gilpin	0-6	Silt loam	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	6-30	Channery loam, shaly silt loam, silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	30-35	Channery loam, very channery silt loam, very shaly silty clay loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
5D*, 5E*:											
Bland	0-4	Silty clay loam	CH	A-7	0-5	90-95	85-95	75-95	60-95	50-65	25-35
	4-30	Silty clay, clay	CH	A-7	0-5	90-95	85-95	75-95	65-90	65-80	35-45
	30-36	Channery silty clay loam, shaly clay.	CH, GC, SC	A-2, A-7	10-30	40-80	30-70	25-70	20-65	65-80	35-45
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
6B, 6C, 6D--- Bland	0-4	Silty clay loam	CH	A-7	0-5	90-95	85-95	75-95	60-95	50-65	25-35
	4-30	Silty clay, clay	CH	A-7	0-5	90-95	85-95	75-95	65-90	65-80	35-45
	30-36	Channery silty clay loam, shaly clay.	CH, GC, SC	A-2, A-7	10-30	40-80	30-70	25-70	20-65	65-80	35-45
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
7C---------- Botetourt	0-7	Loam----------	ML, CL-ML, CL	A-4, A-6	0-5	80-100	75-95	60-85	50-80	15-35	NP-15
	7-48	Gravelly sandy clay loam, clay loam, loam.	GC, SC, CL	A-2, A-6, A-7-6	0-10	60-100	50-95	40-90	20-80	30-45	10-20
	48-62	Loam, gravelly loam, clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6, A-1-B	0-10	60-100	50-95	40-90	20-80	20-35	5-20
8D, 8E---------- Brushy	0-10	Gravelly loam----	GM, GP-GM, SC-SM	A-2, A-1, A-4	5-15	40-60	35-50	15-45	10-40	20-35	NP-7
	10-23	Extremely gravelly silt loam, extremely gravelly loam, extremely gravelly fine sandy loam.	GM, SP-SM, SM, GP-GM	A-2, A-1, A-4	20-40	40-85	20-80	15-75	10-70	20-35	NP-7
	23	Gravelly clay loam, very gravelly sandy clay loam, extremely gravelly loam.	---	---	---	---	---	---	---	---	---
9D, 9E---------- Calvin	0-8	Channery silt loam.	ML, CL-ML	A-4	0-15	70-95	70-90	65-90	55-75	15-30	2-10
	8-25	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	2-11
	25-32	Extremely channery silt loam, very channery silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0-20	35-75	15-45	15-45	15-40	23-39	3-13
	32	Unweathered bedrock.	---	---	---	---	---	---	---	0-14	---
10D, 10E--------- Calvin	0-8	Very stony silt loam.	ML, CL	A-4	3-15	70-100	70-100	65-95	55-90	---	---
	8-25	Shaly silt loam, channery loam, very shaly clay loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	25-32	Shaly silt loam, very shaly silt loam, very channery loam.	GM, SM, GM-GC, SC-SM	A-2, A-1, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-11
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
11C, 11D, 11E, 11F----------	0-12	Silt loam, silty clay loam.	CL	A-6, A-7	0-2	95-100	90-100	85-95	75-85	30-50	10-25
Carbo	12-34	Clay----------	CH	A-7	0-5	95-100	85-100	80-95	70-90	60-80	35-55
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
12D*, 12E*, 13E*:											
Carbo	0-12	Silt loam, silty clay loam.	CL	A-6, A-7	0-2	95-100	90-100	85-95	75-85	30-50	10-25
	12-34	Clay	CH	A-7	0-5	95-100	85-100	80-95	70-90	60-80	35-55
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
14C*:											
Cedarcreek	0-4	Very stony loam	GC	A-2, A-4, A-6	15-30	45-60	40-55	30-50	20-40	25-35	7-12
	4-72	Extremely channery loam, very stony silt loam, very channery sandy loam.	GC	A-2, A-4	5-30	30-55	25-50	20-45	15-40	25-35	7-12
Alticrest	0-3	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4, A-2	0-2	80-100	75-100	55-80	34-65	<20	NP-6
	3-35	Sandy loam, loam, fine sandy loam.	ML, CL-ML, SM, SC-SM	A-4, A-2	0-2	80-100	75-100	55-85	34-70	<23	NP-6
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
14E*:											
Cedarcreek	0-4	Very stony loam	GC	A-2, A-4, A-6	15-30	45-60	40-55	30-50	20-40	25-35	7-12
	4-72	Extremely channery loam, very stony silt loam, very channery sandy loam.	GC	A-2, A-4	5-30	30-55	25-50	20-45	15-40	25-35	7-12
Alticrest	0-3	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4, A-2	0-2	80-100	75-100	55-80	34-65	<20	NP-6
	3-35	Sandy loam, loam, fine sandy loam.	ML, CL-ML, SM, SC-SM	A-4, A-2	0-2	80-100	75-100	55-85	34-70	<23	NP-6
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
15C*, 15D*, 15E*:											
Cedarcreek	0-4	Very stony loam	GC	A-2, A-4, A-6	15-30	45-60	40-55	30-50	20-40	25-35	7-12
	4-72	Extremely channery loam, very stony silt loam, very channery sandy loam.	GC	A-2, A-4	5-30	30-55	25-50	20-45	15-40	25-35	7-12

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
15C*, 15D*, 15E*:											
Rock outcrop----	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
16D*, 16E*, 16F*:											
Chiswell--------	0-2	Silt loam--------	CL, SC	A-4, A-6	0-10	80-100	75-90	65-85	45-80	25-40	8-20
	2-17	Very channery silt loam, extremely channery silt loam.	GC, GP-GC, SC	A-2, A-6, A-7-6	0-20	15-75	10-50	10-45	8-40	25-50	10-30
	17	Weathered bedrock	---	---	---	---	---	---	---	---	---
Litz----------	0-5	Channery loam----	GM, GC, ML, CL	A-4, A-2	7-20	60-85	30-75	25-70	25-65	0-25	NP-10
	5-26	Channery loam, very channery loam, very channery clay loam.	GM, GC, GM-GC	A-2, A-4, A-6	15-20	40-60	15-60	14-50	10-45	0-30	NP-15
	26	Weathered bedrock	---	---	---	---	---	---	---	---	---
17B----------	0-13	Loam----------	ML	A-4	0-5	80-100	80-100	60-95	50-85	<30	NP-7
Coursey	13-65	Gravelly sandy clay loam, clay loam, sandy clay loam.	SC, SM, GC, CL	A-1-B, A-2, A-4, A-6	0-10	60-100	50-100	40-90	20-80	<35	NP-15
18B----------	0-7	Very gravelly sandy loam.	SM, GM, GC, GM-GC	A-1, A-2, A-4	0-25	45-65	40-60	30-55	20-45	0-25	NP-10
Craigsville	7-35	Gravelly sandy loam, cobbly loam, very cobbly sandy loam.	SM, GM, GC, SC	A-1, A-2, A-4	25-60	50-80	30-65	25-60	15-40	0-25	NP-10
	35-61	Very gravelly loamy sand, very cobbly loamy sand, extremely stony loamy sand.	GC, GM, GP-GM, GM-GC	A-1, A-2	35-75	35-55	30-50	20-45	10-25	0-25	NP-8
19D*, 19E*:											
Drypond---------	0-3	Very gravelly sandy loam.	GW-GC, GM-GC, GC	A-1, A-2, A-4	0-20	35-75	25-50	20-45	10-45	0-25	NP-10
	3-11	Very gravelly loam, very gravelly sandy loam, extremely channery sandy clay loam.	GW-GC, GM-GC, GC	A-1, A-2, A-4	5-25	35-75	15-50	10-45	10-40	0-30	NP-15
	11-16	Very gravelly loam, extremely gravelly sandy loam, extremely channery sandy clay loam.	GW-GC, GM-GC, GC	A-1, A-2	10-30	15-60	10-50	10-45	5-35	0-30	NP-15
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
19D*, 19E*:											
Rock outcrop----	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
20B, 20C, 20D, 20E, 20F-------- Frederick	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	75-95	75-90	<35	NP-15
	8-14	Silty clay loam, silty clay, clay.	CH, MH	A-7	0-5	80-100	75-100	70-95	60-90	50-70	20-40
	14-50	Clay, silty clay-	CH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	30-55
	50-62	Clay, silty clay-	CH	A-7	0-5	90-100	85-100	75-100	65-95	50-75	24-45
21B, 21C, 21D, 21E, 21F-------- Frederick	0-8	Gravelly silt loam.	GM, GC, ML, CL	A-4, A-6	0-10	60-80	50-75	40-70	35-65	0-35	NP-15
	8-14	Gravelly silty clay loam, silty clay, clay.	CH, MH, SM, SC	A-7	0-5	80-100	50-95	45-90	35-85	50-70	20-40
	14-50	Clay, silty clay-	CH	A-7	0-5	90-100	85-100	70-100	60-85	60-85	30-50
	50-62	Clay, silty clay-	CH	A-7	0-5	90-100	85-100	70-100	50-75	50-75	25-45
22B, 22C, 22D, 22E---------- Frederick	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	75-95	75-90	<35	NP-15
	8-14	Silty clay loam, silty clay, clay.	CH, MH	A-7	0-5	80-100	75-100	70-95	60-90	50-70	20-40
	14-50	Clay, silty clay-	CH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	30-55
	50-62	Clay, silty clay-	CH	A-7	0-5	90-100	85-100	75-100	65-95	50-75	24-45
23C*, 23D*:											
Gilpin----------	0-6	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	6-30	Channery loam, shaly silt loam, silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	30-35	Channery loam, very channery silt loam, very shaly silty clay loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Berks----------	0-4	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	4-14	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	14-33	Channery loam, very channery loam, channery silt loam.	GM, SM, GM-GC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	33	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
24C, 24D, 24E---- Grimsley	0-10	Very stony loam--	ML, CL-ML, SM, SC-SM	A-4, A-2, A-1-B	15-35	65-90	60-85	35-80	20-65	15-30	NP-10
	10-60	Stony loam, stony clay loam, stony sandy clay loam.	GC, GM-GC, SC, SC-SM	A-2, A-4, A-6, A-1-B	25-45	50-75	45-70	25-60	15-50	20-39	5-20
	60	Weathered bedrock	---	---	---	---	---	---	---	---	---
25D*, 25E*:											
Grimsley--------	0-10	Very stony loam--	ML, CL-ML, SM, SC-SM	A-4, A-2, A-1-B	15-35	65-90	60-85	35-80	20-65	15-30	NP-10
	10-60	Stony loam, stony clay loam, stony sandy clay loam.	GC, GM-GC, SC, SC-SM	A-2, A-4, A-6, A-1-B	25-45	50-75	45-70	25-60	15-50	20-39	5-20
	60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Cedarcreek------	0-4	Extremely stony loam.	GC	A-2, A-4, A-6	30-55	45-60	40-55	30-50	20-40	25-35	7-12
	4-72	Extremely channery loam, very stony silt loam, very channery sandy loam.	GC	A-2, A-4	5-30	30-55	25-50	20-45	15-40	25-35	7-12
Berks-----------	0-6	Very stony silt loam.	GM, SM, GC, SC	A-2, A-4	15-30	40-80	35-70	30-60	25-45	25-36	5-10
	6-24	Shaly loam, very shaly loam, shaly silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	24-33	Shaly loam, very shaly loam, shaly silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	33	Weathered bedrock	---	---	---	---	---	---	---	---	---
26B, 26C, 26D, 26E---------- Groseclose	0-11	Silt loam--------	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	80-100	75-100	50-100	30-90	20-35	5-15
	11-61	Clay, silty clay loam, clay loam.	CH	A-7	0	80-100	75-100	70-100	50-95	35-65	20-45
27B, 27C--------- Guernsey	0-10	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0-2	90-100	80-100	75-100	70-90	25-40	4-14
	10-21	Silty clay loam, silt loam.	CL, CH, ML, MH	A-7, A-6	0-2	90-100	80-100	75-100	70-100	30-55	10-30
	21-56	Silty clay, clay, silty clay loam.	CH, CL, ML, MH	A-7	0-10	75-100	65-100	60-100	55-100	45-65	15-35
	56-61	Clay, silty clay, shaly silty clay loam.	CH, MH, ML, CL	A-7	0-20	70-100	60-90	55-90	55-90	40-70	15-40
28C, 28D, 28E, 28F---------- Lily	0-4	Fine sandy loam--	SM	A-4, A-2	0-5	90-100	85-100	55-80	25-50	<20	NP-4
	4-30	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	30-36	Sandy clay loam, clay loam, gravelly sandy clay loam.	SM, SC, ML, CL	A-4, A-2, A-6, A-1-B	0-10	65-100	50-100	40-95	20-75	<35	3-15
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
29D, 29E--- Lily	0-6	Very stony sandy loam.	SM, ML	A-2, A-4	5-20	90-95	85-90	55-90	25-75	<35	NP-7
	6-24	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	5-20	90-95	85-90	60-85	40-80	<35	3-15
	24-26	Sandy clay loam, loam, gravelly clay loam.	SM, GC, ML, CL	A-2, A-4, A-6	5-20	65-95	60-90	50-85	20-75	<35	NP-15
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
30C--- Madsheep	0-5	Channery silt loam.	ML, CL	A-4	0-3	70-95	70-90	65-90	55-75	---	---
	5-25	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
30D--- Madsheep	0-5	Channery silt loam.	ML, CL	A-4	0-3	70-95	70-90	65-90	55-75	---	---
	5-25	Channery silt loam, channery loam, very channery loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
31E--- Madsheep	0-7	Very stony silt loam.	ML, CL	A-4	3-15	70-100	70-100	65-95	55-90	---	---
	7-27	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
32A--- Melvin	0-10	Silt loam---	CL, CL-ML, ML	A-4	0	95-100	90-100	80-100	80-95	25-35	4-10
	10-30	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	80-98	25-40	5-20
	30-62	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	70-100	60-98	25-40	5-20
33*--- Mine Tipples, Dumps, and Tailings	0-60	Fragmental material.	GP	A-1	50-90	10-30	5-15	0-5	0	---	NP

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
34B, 34C, 34D----Murrill	0-22	Silt loam---------	ML, CL, SC, SC-SM	A-4, A-6	0	75-95	75-90	60-85	40-75	20-40	3-15
	22-44	Channery silty clay loam, channery sandy clay loam, clay loam, loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-15	65-85	60-70	55-65	50-65	20-50	5-25
	44-61	Clay loam, clay, gravelly clay loam.	CH, MH, CL	A-6, A-7	0-20	80-100	65-100	60-100	55-100	35-75	20-40
35A*:											
Newark----------	0-5	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	90-100	80-100	55-95	<32	NP-10
	5-19	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	70-100	22-42	3-20
	19-61	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-3	75-100	70-100	65-100	55-95	22-42	3-20
Lindside--------	0-9	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	80-100	55-90	20-35	2-15
	9-51	Silty clay loam, silt loam, very fine sandy loam.	CL, ML, CL-ML	A-4, A-6	0	100	95-100	90-100	70-95	25-40	4-18
	51-61	Stratified silty clay loam to gravelly sandy loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	60-100	55-100	45-100	30-95	20-40	4-18
36F*:											
Newbern---------	0-5	Silt loam--------	ML, CL-ML, CL	A-4	0-5	80-100	75-95	65-95	50-90	10-20	NP-10
	5-14	Loam, silt loam, channery loam.	ML, CL, CL-ML, GM	A-2, A-4, A-6	0-5	60-100	50-95	30-95	20-90	10-30	NP-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
37C, 37D--------- Oriskany	0-6	Gravelly fine sandy loam.	SM, ML, CL	A-2, A-4	0-5	70-85	60-80	35-75	20-60	<30	NP-10
	6-61	Very cobbly fine sandy loam, very cobbly sandy clay loam, extremely stony sandy clay loam.	CL, SC, GC, CL-ML	A-2, A-4, A-6	25-40	50-75	50-75	25-65	20-55	20-40	5-20
38C, 38D, 38E---- Oriskany	0-6	Very stony fine sandy loam.	SM, GM, ML, CL	A-2, A-4	15-60	75-95	70-90	40-85	20-70	0-30	NP-10
	6-61	Very cobbly fine sandy loam, extremely stony sandy clay loam.	CL, SC, CL-ML, GC	A-2, A-4, A-6	30-60	70-80	65-75	50-75	25-60	20-40	5-20

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
39D*, 39E*:											
Paddyknob	0-4	Extremely stony loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	15-30	50-90	45-80	40-75	20-55	10-32	NP-10
	4-26	Stony sandy loam, gravelly loam, very gravelly sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	5-10	50-90	45-80	40-75	20-55	10-32	NP-10
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
40D	0-4	Very stony sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
Paddyknob	4-26	Stony sandy loam, gravelly loam, very gravelly sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	5-10	50-90	45-80	40-75	20-55	10-32	NP-10
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
40E	0-4	Very stony sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
Paddyknob	4-26	Stony sandy loam, gravelly loam, very gravelly sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	5-10	50-90	45-80	40-75	20-55	10-32	NP-10
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
41A	0-5	Fine sandy loam	ML, SM, CL-ML	A-4	0-5	95-100	75-100	60-70	30-40	20-35	1-10
Philo	5-44	Silt loam, loam, fine sandy loam.	ML, SM, CL-ML	A-4	0-5	95-100	75-100	70-90	45-80	20-35	1-10
	44-60	Stratified sand to silt loam.	GM, SM, ML, CL-ML	A-2, A-4	0-5	60-95	50-90	40-85	30-80	15-30	1-10
42B, 42C, 43B, 43C	0-8	Silt loam	CL, CL-ML	A-6, A-4	0	95-100	90-100	80-95	60-85	20-34	6-15
Pisgah	8-50	Clay, silty clay	CH	A-7	0	95-100	90-100	80-95	80-90	65-75	35-45
	50-65	Clay, clay loam, silty clay loam.	CH	A-7	0	95-100	90-100	80-95	60-90	55-65	35-45
44*	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Pits											
45A	0-8	Fine sandy loam	SM, ML, CL-ML, SC-SM	A-2, A-4	0	85-100	75-100	51-85	25-55	<20	NP-5
Pope	8-45	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4	0	95-100	80-100	51-95	25-75	<30	NP-7
	45-64	Sandy loam, loamy sand.	SM, SC-SM, ML, GM	A-2, A-1, A-4	0-20	45-100	35-100	30-95	15-70	<30	NP-7

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
46C*, 46D*:											
Poplimento	0-6	Silt loam	CL, CL-ML	A-4, A-6	0-5	80-100	75-100	65-100	50-90	25-40	5-15
	6-45	Channery silty clay loam, very channery silty clay, clay.	CL, CH, GC, SC	A-6, A-7, A-2-6	0-10	45-90	40-100	35-80	30-75	35-60	15-35
	45-62	Channery silty clay, very channery silty clay loam, clay.	CL, CH, GC, SC	A-2, A-6, A-7	0-15	45-90	40-100	35-80	30-75	35-55	15-30
Westmoreland	0-10	Silt loam	ML, CL	A-4, A-6	0	85-100	80-100	75-95	60-95	<35	NP-10
	10-48	Silty clay loam, channery loam, channery silt loam.	CL, ML, GM, GC	A-4, A-6, A-7	0-15	65-100	55-95	50-90	45-85	22-45	2-20
	48-61	Very channery loam, very channery silt loam, shaly silty clay loam.	GM, GC, SM, SC	A-2, A-1, A-4, A-6	0-20	25-95	20-95	15-90	15-80	20-40	2-20
47A	0-14	Silt loam	ML, CL	A-4, A-6, A-7	0	95-100	90-100	90-100	90-100	25-50	4-20
Purdy	14-47	Silty clay, clay loam.	CL, CH, MH	A-6, A-7	0	95-100	90-100	85-100	75-85	30-65	11-30
	47-61	Silty clay, clay loam, clay.	CL, CH, MH	A-6, A-7	0	95-100	90-100	85-100	70-95	30-65	11-30
48B	0-12	Silt loam	ML, CL-ML, SC-SM, SM	A-4	0-3	85-100	75-100	55-95	35-85	<25	NP-7
Timberville	12-25	Silt loam, silty clay loam, gravelly loam.	CL, CL-ML, GC, GM-GC	A-4, A-6	0-5	55-100	50-100	40-90	35-85	15-40	5-20
	25-61	Clay, silty clay loam, gravelly clay loam.	CL, CH, SC, GC	A-6, A-7	0-10	55-95	50-95	45-90	40-85	35-60	14-32
49B, 49C	0-9	Very stony loam	CL-ML, SC-SM, SC	A-4, A-6	2-10	80-100	60-95	60-90	40-80	15-30	4-15
Tumbling	9-62	Clay loam, cobbly clay, cobbly clay loam.	CL	A-7	5-45	75-95	60-95	55-90	50-90	40-50	15-25
50*:											
Udorthents.											
Urban land	0-6	Variable	---	---	---	---	---	---	---	---	---
51D*, 51E*:											
Wallen	0-4	Extremely stony sandy loam.	SM, GM, ML, SC-SM	A-2, A-4	15-30	50-90	50-80	45-75	25-55	<35	NP-10
	4-24	Very channery sandy loam, very cobbly loam, very cobbly fine sandy loam.	SM, GM, GM-GC, SC-SM	A-2, A-4, A-1	20-55	35-65	30-60	20-50	10-40	<35	NP-10
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
51D*, 51E*:											
Rock outcrop----	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
52C, 52D, 52E----	0-4	Very stony sandy loam.	SM, GM, ML, SC-SM	A-2, A-4	5-20	50-90	50-80	45-75	25-55	<35	NP-10
Wallen	4-22	Very channery sandy loam, very cobbly loam, very cobbly fine sandy loam.	SM, GM, GM-GC, SC-SM	A-2, A-4, A-1	20-55	35-65	30-60	20-50	10-40	<35	NP-10
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
53E*, 53F*:											
Westmoreland----	0-10	Silt loam--------	ML, CL	A-4, A-6	0	85-100	80-100	75-95	60-95	<35	NP-10
	10-48	Silty clay loam, channery loam, channery silt loam.	CL, ML, GM, GC	A-4, A-6, A-7	0-15	65-100	55-95	50-90	45-85	22-45	2-20
	48-61	Very channery loam, very channery silt loam, shaly silty clay loam.	GM, GC, SM, SC	A-2, A-1, A-4, A-6	0-20	25-95	20-95	15-90	15-80	20-40	2-20
Poplimento------	0-6	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	80-100	75-100	65-100	50-90	25-40	5-15
	6-45	Channery silty clay loam, very channery silty clay, clay.	CL, CH, GC, SC	A-6, A-7, A-2-6	0-10	45-90	40-100	35-80	30-75	35-60	15-35
	45-62	Channery silty clay, very channery silty clay loam, clay.	CL, CH, GC, SC	A-2, A-6, A-7	0-15	45-90	40-100	35-80	30-75	35-55	15-30
Berks-----------	0-6	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	6-24	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	24-33	Channery loam, very channery loam, channery silt loam.	GM, SM, GM-GC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	33	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 18.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
54A---------- Wolfgap	0-11	Clay loam--------	ML, CL, CL-ML	A-4	0	95-100	90-100	75-100	55-90	20-35	2-10
	11-58	Clay loam, sandy clay loam, gravelly sandy loam.	ML, CL, SM, SC	A-4, A-6	0-5	90-100	70-100	65-100	45-80	20-40	2-20
	58-72	Very gravelly loamy sand, extremely gravelly fine sandy loam, extremely gravelly loam.	GC, GM-GC, SP-SM	A-1, A-2, A-3, A-4	10-20	85-90	20-75	10-65	4-45	0-20	NP-10

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 19.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
1A, 1B	0-11	15-27	1.20-1.40	0.6-2.0	0.12-0.22	3.6-5.5	Low	0.32	4	1-4
Allegheny	11-32	18-35	1.20-1.50	0.6-2.0	0.13-0.18	3.6-5.5	Low	0.28		
	32-61	10-20	1.40-1.60	0.6-6.0	0.03-0.08	3.6-5.5	Low	0.28		
2C, 2D, 2E	0-3	8-18	1.40-1.55	2.0-6.0	0.12-0.18	4.5-5.5	Low	0.24	2	1-3
Alticrest	3-35	8-18	1.40-1.55	2.0-6.0	0.10-0.16	4.5-5.5	Low	0.20		
	35	---	---	0.00-0.2	---	---				
3C*, 3D*, 3E*:										
Berks	0-6	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low	0.17	3-2	2-4
	6-24	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	24-33	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	33	---	---	0.2-2.0	---	---				
Weikert	0-7	15-27	1.20-1.40	2.0-6.0	0.08-0.14	4.5-6.0	Low	0.28	2	1-4
	7-19	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-6.0	Low	0.28		
	19	---	---	0.6-20	---	---				
4E*:										
Berks	0-4	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low	0.17	3-2	2-4
	4-14	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	14-33	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	33	---	---	0.2-2.0	---	---				
Gilpin	0-6	15-27	1.20-1.40	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.24	3-2	.5-4
	6-30	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.24		
	30-35	15-35	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low	0.24		
	35	---	---	0.2-2.0	---	---				
4F*:										
Berks	0-4	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low	0.17	3-2	2-4
	4-14	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	14-33	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	33	---	---	0.2-2.0	---	---				
Gilpin	0-6	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.32	3-2	.5-4
	6-30	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.24		
	30-35	15-35	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low	0.24		
	35	---	---	0.2-2.0	---	---				
5D*, 5E*:										
Bland	0-4	15-35	1.20-1.50	0.6-2.0	0.16-0.20	5.1-7.3	Moderate	0.43	2	1-3
	4-30	45-60	1.30-1.60	0.2-0.6	0.10-0.15	5.1-7.3	Moderate	0.43		
	30-36	20-50	1.30-1.60	0.2-0.6	0.06-0.15	5.1-7.3	Moderate	0.28		
	36	---	---	---	---	---				
Rock outcrop	0-60	---	---	0.06-6.0	---	---				---
6B, 6C, 6D	0-4	15-35	1.20-1.50	0.6-2.0	0.16-0.20	5.1-7.3	Moderate	0.43	2	1-3
Bland	4-30	45-60	1.30-1.60	0.2-0.6	0.10-0.15	5.1-7.3	Moderate	0.43		
	30-36	20-50	1.30-1.60	0.2-0.6	0.06-0.15	5.1-7.3	Moderate	0.28		
	36	---	---	---	---	---				

See footnote at end of table.

Table 19.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
7C----------	0-7	7-27	1.35-1.60	0.6-2.0	0.15-0.20	5.1-7.3	Low----------	0.32	5	.5-4
Botetourt	7-48	18-35	1.45-1.70	0.6-2.0	0.07-0.15	5.1-6.5	Low----------	0.28		
	48-62	18-35	1.45-1.70	0.6-2.0	0.07-0.15	5.1-6.5	Low----------	0.28		
8D, 8E----------	0-10	10-20	1.20-1.40	0.6-2.0	0.08-0.12	3.6-6.0	Low----------	0.20	2	1-3
Brushy	10-23	12-35	1.40-1.60	0.6-2.0	0.08-0.12	3.6-6.0	Low----------	0.17		
	23	---	---	0.00-0.06	---	---	----------	----		
9D, 9E----------	0-8	10-25	1.20-1.40	2.0-6.0	0.10-0.16	5.1-6.5	Low----------	0.20	3-2	1-3
Calvin	8-25	10-25	1.40-1.60	2.0-6.0	0.08-0.16	5.1-6.5	Low----------	0.20		
	25-32	10-25	1.40-1.60	2.0-6.0	0.06-0.10	5.1-6.5	Low----------	0.20		
	32	---	---	0.2-6.0	0.0-0.0	---	----------	----		
10D, 10E---------	0-8	10-25	1.20-1.40	2.0-6.0	0.10-0.18	4.5-6.0	Low----------	0.15	3	2-6
Calvin	8-25	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-6.0	Low----------	0.20		
	25-32	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-6.0	Low----------	0.20		
	32	---	---	0.2-6.0	---	---	----------	----		
11C, 11D, 11E,										
11F----------	0-12	20-40	1.20-1.40	0.6-2.0	0.16-0.19	4.5-7.3	Moderate-----	0.37	2-1	.5-3
Carbo	12-34	60-80	1.30-1.45	0.06-0.2	0.10-0.14	5.6-7.8	High---------	0.24		
	34	---	---	2.0-20	---	---	----------	----		
12D*, 12E*, 13E*:										
Carbo----------	0-12	20-40	1.20-1.40	0.6-2.0	0.16-0.19	4.5-7.3	Moderate-----	0.37	2-1	.5-3
	12-34	60-80	1.30-1.45	0.06-0.2	0.10-0.14	5.6-7.8	High---------	0.24		
	34	---	---	2.0-20	---	---	----------	----		
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	----------	----	---	---
14C*, 14E*:										
Cedarcreek------	0-4	18-27	1.35-1.65	0.6-6.0	0.07-0.16	3.6-5.5	Low----------	0.32	5	<.5
	4-72	18-27	1.35-1.65	0.6-6.0	0.07-0.16	3.6-5.5	Low----------	0.32		
Alticrest-------	0-3	8-18	1.40-1.55	2.0-6.0	0.12-0.18	4.5-5.5	Low----------	0.24	2	1-3
	3-35	8-18	1.40-1.55	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.20		
	35	---	---	0.00-0.2	---	---	----------	----		
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	----------	----	---	---
15C*, 15D*, 15E*:										
Cedarcreek------	0-4	18-27	1.35-1.65	0.6-6.0	0.07-0.16	3.6-5.5	Low----------	0.32	5	<.5
	4-72	18-27	1.35-1.65	0.6-6.0	0.07-0.16	3.6-5.5	Low----------	0.32		
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	----------	----	---	---
16D*, 16E*, 16F*:										
Chiswell--------	0-2	10-27	1.20-1.40	0.6-2.0	0.20-0.24	3.6-6.0	Low----------	0.37	2	.5-2
	2-17	10-35	1.20-1.60	0.6-2.0	0.04-0.10	3.6-6.0	Low----------	0.10		
	17	---	---	0.0-0.2	---	---	----------	----		
Litz------------	0-5	10-27	1.20-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Low----------	0.32	3	.5-2
	5-26	10-35	1.20-1.50	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.32		
	26	---	---	0.00-0.2	---	---	----------	----		
17B----------	0-13	18-27	1.35-1.60	0.6-2.0	0.14-0.23	3.6-5.5	Low----------	0.32	5	1-3
Coursey	13-65	18-35	1.45-1.70	0.6-2.0	0.07-0.15	3.6-5.5	Low----------	0.28		

See footnote at end of table.

Table 19.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
18B--Craigsville	1-8	5-15	1.20-1.40	2.0-20	0.06-0.12	4.5-5.5	Low	0.17	3	1-5
	8-36	5-15	1.30-1.60	2.0-20	0.06-0.15	4.5-5.5	Low	0.17		
	36-62	5-10	1.35-1.55	6.0-20	0.04-0.09	4.5-5.5	Low	0.17		
19D*, 19E*:										
Drypond	0-3	10-25	1.25-1.40	6.0-20	0.08-0.10	3.6-5.0	Low	0.15	1	.5-2
	3-11	15-30	1.20-1.40	6.0-20	0.04-0.08	3.6-5.0	Low	0.10		
	11-16	15-30	1.20-1.40	6.0-20	0.03-0.08	3.6-5.0	Low	0.05		
	16	---	---	0.00-0.2	---	---	---	---		
Rock outcrop	0-60	---	---	0.06-6.0	---	---	---	---	---	---
20B, 20C, 20D, 20E, 20F--Frederick	0-8	13-27	1.25-1.50	2.0-6.0	0.16-0.24	4.5-6.0	Low	0.32	5	1-2
	8-14	35-75	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Moderate	0.24		
	14-50	40-80	1.20-1.50	0.6-2.0	0.10-0.18	4.5-6.0	High	0.24		
	50-62	40-80	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.0	High	0.24		
21B, 21C, 21D, 21E, 21F--Frederick	0-8	13-27	1.25-1.50	2.0-6.0	0.12-0.20	4.5-6.0	Low	0.28	4	1-2
	8-14	35-75	1.20-1.50	0.6-2.0	0.10-0.18	4.5-6.0	Moderate	0.24		
	14-50	40-80	1.20-1.50	0.6-2.0	0.10-0.18	4.5-6.0	High	0.24		
	50-62	40-70	1.20-1.50	0.6-2.0	0.09-0.20	4.5-6.0	High	0.24		
22B, 22C, 22D, 22E--Frederick	0-8	13-27	1.25-1.50	2.0-6.0	0.16-0.24	4.5-6.0	Low	0.32	5	1-2
	8-14	35-75	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Moderate	0.24		
	14-50	40-80	1.20-1.50	0.6-2.0	0.10-0.18	4.5-6.0	High	0.24		
	50-62	40-80	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.0	High	0.24		
23C*, 23D*:										
Gilpin	0-6	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.32	3-2	.5-4
	6-30	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.24		
	30-35	15-35	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low	0.24		
	35	---	---	0.2-2.0	---	---	---	---		
Berks	0-6	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low	0.17	3-2	2-4
	6-24	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	24-33	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	33	---	---	0.2-2.0	---	---	---	---		
24C, 24D, 24E--Grimsley	0-10	10-20	1.35-1.45	2.0-6.0	0.07-0.12	4.5-5.5	Low	0.20	4	.5-2
	10-60	20-35	1.40-1.50	2.0-6.0	0.05-0.11	4.5-5.5	Low	0.20		
	60	---	---	0.00-0.06	---	---	---	---		
25D*, 25E*:										
Grimsley	0-10	10-20	1.35-1.45	2.0-6.0	0.07-0.12	4.5-5.5	Low	0.20	4	.5-2
	10-60	20-35	1.40-1.50	2.0-6.0	0.05-0.11	4.5-5.5	Low	0.20		
	60	---	---	0.00-0.06	---	---	---	---		
Cedarcreek	0-4	18-27	1.35-1.65	0.6-6.0	0.07-0.16	3.6-5.5	Low	0.32	5	<.5
	4-72	18-27	1.35-1.65	0.6-6.0	0.07-0.16	3.6-5.5	Low	0.32		
Berks	0-6	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low	0.17	3	2-4
	6-24	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	24-33	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	33	---	---	0.2-20	---	---	---	---		

See footnote at end of table.

Table 19.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
26B, 26C, 26D, 26E---------- Groseclose	0-11	7-27	1.25-1.55	2.0-6.0	0.11-0.20	3.6-5.5	Low----------	0.43	5	1-2
	11-61	35-60	1.35-1.60	0.06-0.2	0.10-0.17	3.6-5.5	High----------	0.24		
27B, 27C---------- Guernsey	0-10	13-27	1.30-1.50	0.6-2.0	0.19-0.24	4.5-7.3	Low----------	0.43	5-4	1-3
	10-21	22-38	1.35-1.55	0.2-2.0	0.15-0.21	4.5-6.0	Moderate-----	0.43		
	21-56	35-60	1.40-1.60	0.06-0.6	0.10-0.15	4.5-7.8	High----------	0.32		
	56-61	35-60	1.40-1.60	0.06-0.6	0.06-0.10	5.1-8.4	High----------	0.32		
28C, 28D, 28E, 28F---------- Lily	0-4	5-20	1.20-1.40	2.0-6.0	0.09-0.16	3.6-5.5	Low----------	0.28	2	.5-4
	4-30	18-35	1.25-1.35	2.0-6.0	0.12-0.18	3.6-5.5	Low----------	0.28		
	30-36	20-35	1.25-1.35	2.0-6.0	0.08-0.17	3.6-5.5	Low----------	0.17		
	36	---	---	0.00-0.2	---	---	----------	----		
29D, 29E---------- Lily	0-6	5-25	1.20-1.40	0.6-6.0	0.09-0.16	3.6-5.5	Low----------	0.24	2	.5-4
	6-24	18-35	1.25-1.55	2.0-6.0	0.12-0.18	3.6-5.5	Low----------	0.24		
	24-26	18-35	1.25-1.55	2.0-6.0	0.08-0.17	3.6-5.5	Low----------	0.17		
	26	---	---	0.0-0.2	---	---	----------	----		
30C---------- Madsheep	0-5	10-25	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low----------	0.20	2	1-3
	5-25	10-25	1.40-1.60	2.0-6.0	0.08-0.16	3.6-5.5	Low----------	0.20		
	25	---	---	0.2-6.0	---	---	----------	----		
30D---------- Madsheep	0-5	10-25	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low----------	0.20	2	1-3
	5-25	10-25	1.40-1.60	2.0-6.0	0.08-0.16	3.6-5.5	Low----------	0.20		
	25	---	---	0.2-6.0	---	---	----------	----		
31E---------- Madsheep	0-7	10-25	1.20-1.40	2.0-6.0	0.10-0.18	3.6-5.5	Low----------	0.15	2	2-6
	7-27	10-25	1.40-1.60	2.0-6.0	0.08-0.16	3.6-5.5	Low----------	0.20		
	27	---	---	0.2-6.0	---	---	----------	----		
32A---------- Melvin	0-10	12-17	1.20-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low----------	0.43	5	.5-3
	10-30	12-35	1.30-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low----------	0.43		
	30-62	7-40	1.40-1.70	0.6-2.0	0.16-0.23	5.6-7.8	Low----------	0.43		
33*---------- Mine Tipples, Dumps, and Tailings	0-60	0-1	---	>6.0	0.01-0.02	---	Low----------	----	---	<.1
34B, 34C, 34D---- Murrill	0-22	10-20	1.20-1.50	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.32	5	1-4
	22-44	18-35	1.40-1.70	0.6-2.0	0.10-0.14	4.5-6.0	Low----------	0.24		
	44-61	27-55	1.40-1.70	0.2-2.0	0.08-0.12	4.5-6.0	Moderate-----	0.28		
35A*:										
Newark----------	0-8	7-27	1.20-1.40	0.6-2.0	0.15-0.23	5.6-7.8	Low----------	0.43	5	1-4
	8-30	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.6-7.8	Low----------	0.43		
	30-61	12-40	1.30-1.50	0.6-2.0	0.15-0.22	5.6-7.8	Low----------	0.43		
Lindside--------	0-9	15-27	1.20-1.40	0.6-2.0	0.20-0.26	5.1-7.8	Low----------	0.32	5	2-4
	9-51	18-35	1.20-1.40	0.2-2.0	0.17-0.22	5.1-7.8	Low----------	0.37		
	51-61	18-35	1.20-1.40	0.2-6.0	0.12-0.18	5.6-7.8	Low----------	0.32		
36F*:										
Newbern---------	0-5	10-27	1.20-1.50	0.6-2.0	0.07-0.20	5.6-7.3	Low----------	0.28	1	1-2
	5-14	10-27	1.30-1.60	0.6-2.0	0.07-0.20	5.6-7.3	Low----------	0.28		
	14	---	---	2.0-20	---	---	----------	----		
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	----------	----	---	---

See footnote at end of table.

Table 19.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
37C, 37D	0-6	5-15	1.20-1.40	2.0-6.0	0.04-0.16	4.5-5.5	Low	0.15	5	.5-2
Oriskany	6-61	20-35	1.30-1.65	0.6-2.0	0.04-0.12	4.5-5.5	Low	0.10		
38C, 38D, 38E	0-6	5-15	1.20-1.40	2.0-6.0	0.04-0.14	4.5-5.5	Low	0.15	5	.5-2
Oriskany	6-61	20-35	1.30-1.65	0.6-2.0	0.04-0.12	4.5-5.5	Low	0.10		
39D*, 39E*:										
Paddyknob	0-4	10-20	1.20-1.50	6.0-20	0.08-0.12	3.6-5.5	Low	0.17	2	2-5
	4-26	7-18	1.20-1.50	6.0-20	0.08-0.12	3.6-4.4	Low	0.17		
	26	---	---	2.0-6.0	---	---	---	---		
Rock outcrop	0-60	---	---	0.06-6.0	---	---	---	---	---	---
40D	0-4	10-20	1.20-1.50	6.0-20	0.08-0.12	3.6-5.5	Low	0.17	2	2-5
Paddyknob	4-26	7-18	1.20-1.50	6.0-20	0.08-0.12	3.6-4.4	Low	0.17		
	26	---	---	2.0-6.0	---	---	---	---		
40E	0-4	10-20	1.20-1.50	6.0-20	0.08-0.12	3.6-5.5	Low	0.17	2	2-5
Paddyknob	4-26	7-18	1.20-1.50	6.0-20	0.08-0.12	3.6-4.4	Low	0.17		
	26-30	---	---	2.0-6.0	---	---	---	---		
41A	0-4	10-18	1.20-1.40	2.0-6.0	0.10-0.14	4.5-6.0	Low	0.28	5	2-4
Philo	4-44	10-18	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.0	Low	0.32		
	44-60	5-18	1.20-1.40	2.0-6.0	0.06-0.10	4.5-6.0	Low	0.24		
42B, 42C, 43B,										
43C	0-8	10-27	1.00-1.20	0.6-2.0	0.16-0.19	5.1-6.5	Low	0.37	5	1-3
Pisgah	8-50	40-60	1.20-1.50	0.6-2.0	0.10-0.15	5.1-6.5	Moderate	0.24		
	50-65	30-60	1.20-1.50	0.6-2.0	0.10-0.15	5.1-6.5	Moderate	0.24		
44*	0-60	---	---	---	---	---	---	---	---	---
Pits										
45A	0-8	5-15	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low	0.28	5	1-4
Pope	8-45	5-18	1.30-1.60	0.6-6.0	0.10-0.18	3.6-5.5	Low	0.28		
	45-64	5-20	1.30-1.60	0.6-6.0	0.10-0.18	3.6-5.5	Low	0.28		
46C*, 46D*:										
Poplimento	0-6	17-27	1.20-1.35	0.6-2.0	0.15-0.22	4.5-6.5	Low	0.32	4	.5-2
	6-45	30-55	1.30-1.55	0.2-0.6	0.07-0.14	4.5-6.5	High	0.24		
	45-62	27-50	1.25-1.50	0.2-0.6	0.05-0.12	4.5-6.5	Moderate	0.24		
Westmoreland	0-10	15-30	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low	0.37	3-2	1-4
	10-48	20-35	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low	0.28		
	48-61	18-35	1.20-1.50	0.6-2.0	0.06-0.10	5.1-6.0	Low	0.17		
47A	0-14	18-35	1.30-1.50	0.2-0.6	0.18-0.24	3.6-5.5	Moderate	0.43	5	2-4
Purdy	14-47	35-50	1.30-1.60	<0.2	0.12-0.18	3.6-5.5	Moderate	0.32		
	47-61	35-50	1.30-1.60	<0.2	0.10-0.16	3.6-5.5	Moderate	0.32		
48B	0-12	6-25	1.30-1.50	2.0-6.0	0.11-0.20	3.6-6.5	Low	0.32	5	1-3
Timberville	12-25	13-35	1.30-1.50	0.6-2.0	0.11-0.19	3.6-6.5	Low	0.24		
	25-61	35-60	1.40-1.55	0.6-2.0	0.10-0.18	3.6-6.5	Moderate	0.24		
49B, 49C	0-9	10-27	1.20-1.45	0.6-6.0	0.14-0.18	4.5-5.5	Low	0.24	5	.5-2
Tumbling	9-62	35-50	1.20-1.40	0.6-2.0	0.08-0.12	4.5-5.5	Low	0.17		

See footnote at end of table.

Table 19.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
50*:										
Udorthents.										
Urban land	0-6	---	---	---	---	---	---			---
51D*, 51E*:										
Wallen	0-4	8-20	1.40-1.55	2.0-6.0	0.08-0.12	3.5-6.0	Low	0.17	2	1-2
	4-22	8-20	1.40-1.55	2.0-6.0	0.05-0.10	3.5-6.0	Low	0.17		
	22-24	---	---	0.00-0.2	---	---	---			
Rock outcrop	0-60	---	---	0.06-6.0	---	---	---			---
52C, 52D, 52E	0-4	8-20	1.40-1.55	2.0-6.0	0.08-0.12	3.5-6.0	Low	0.17	2	1-2
Wallen	4-22	8-20	1.40-1.55	2.0-6.0	0.05-0.10	3.5-6.0	Low	0.17		
	22-24	---	---	0.00-0.2	---	---	---			
53E*, 53F*:										
Westmoreland	0-10	15-30	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low	0.37	3-2	1-4
	10-48	20-35	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low	0.28		
	48-61	18-35	1.20-1.50	0.6-2.0	0.06-0.10	5.1-6.0	Low	0.17		
Poplimento	0-6	17-27	1.20-1.35	0.6-2.0	0.15-0.22	4.5-6.5	Low	0.32	4	.5-2
	6-45	30-55	1.30-1.55	0.2-0.6	0.07-0.14	4.5-6.5	High	0.24		
	45-62	27-50	1.25-1.50	0.2-0.6	0.05-0.12	4.5-6.5	Moderate	0.24		
Berks	0-6	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low	0.17	3-2	2-4
	6-24	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	24-33	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low	0.17		
	33	---	---	0.2-2.0	---	---	---			
54A	0-11	12-30	1.35-1.60	0.6-2.0	0.12-0.18	6.1-8.4	Low	0.32	4	1-5
Wolfgap	11-58	18-30	1.45-1.70	0.6-2.0	0.08-0.16	6.1-8.4	Low	0.32		
	58-72	8-15	1.50-1.70	6.0-20	0.04-0.08	6.1-8.4	Low	0.20		

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 20.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding	High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
			Ft			In				
1A, 1B---------- Allegheny	B	None----------	>6.0	---	---	>60	---	Moderate	Low------	High.
2C, 2D, 2E-------- Alticrest	B	None----------	>6.0	---	---	20-40	Hard	None-----	Low------	High.
3C*, 3D*, 3E*:										
Berks----------	C	None----------	>6.0	---	---	20-40	Soft	Low------	Low------	High.
Weikert----------	B/D	None----------	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
4E*, 4F*:										
Berks----------	C	None----------	>6.0	---	---	20-40	Soft	Low------	Low------	High.
Gilpin----------	C	None----------	>6.0	---	---	20-40	Soft	Moderate	Low------	High.
5D*, 5E*:										
Bland----------	C	None----------	>6.0	---	---	20-40	Hard	Moderate	High-----	Moderate.
Rock outcrop-----	D	None----------	>6.0	---	---	0	Hard	---	---	---
6B, 6C, 6D-------- Bland	C	None----------	>6.0	---	---	20-40	Hard	Moderate	High-----	Moderate.
7C---------- Botetourt	C	None----------	1.5-2.5	Apparent	Nov-May	>60	---	High-----	Moderate	High.
8D, 8E---------- Brushy	B	None----------	>6.0	---	---	20-40	Hard	Moderate	Low------	High.
9D, 9E, 10D, 10E-- Calvin	C	None----------	>6.0	---	---	20-40	Soft	Moderate	Low------	Moderate.
11C, 11D, 11E, 11F---------- Carbo	C	None----------	>6.0	---	---	20-40	Hard	Moderate	High-----	Low.
12D*, 12E*, 13E*:										
Carbo----------	C	None----------	>6.0	---	---	20-40	Hard	Moderate	High-----	Low.
Rock outcrop-----	D	None----------	>6.0	---	---	0	Hard	---	---	---
14C*, 14E*:										
Cedarcreek-------	C	None----------	>6.0	---	---	>60	---	Moderate	Moderate	High.
Alticrest--------	B	None----------	>6.0	---	---	20-40	Hard	None-----	Low------	High.
Rock outcrop-----	D	None----------	>6.0	---	---	0	Hard	---	---	---
15C*, 15D*, 15E*:										
Cedarcreek-------	C	None----------	>6.0	---	---	>60	---	Moderate	Moderate	High.
Rock outcrop-----	D	None----------	>6.0	---	---	0	Hard	---	---	---

See footnote at end of table.

Table 20.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding	High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
			Ft			In				
16D*, 16E*, 16F*: Chiswell	D	None	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
Litz	C	None	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
17B—Coursey	C	None	2.0-3.0	Apparent	Nov-May	>60	---	High	Moderate	High.
18B—Craigsville	B	Frequent	>6.0	---	---	>60	---	Moderate	Low	Moderate.
19D*, 19E*: Drypond	D	None	>6.0	---	---	10-20	Hard	Low	---	---
Rock outcrop	D	None	>6.0	---	---	0	Hard	---	---	---
20B, 20C, 20D, 20E, 20F, 21B, 21C, 21D, 21E, 21F, 22B, 22C, 22D, 22E—Frederick	B	None	>6.0	---	---	>60	---	Moderate	Moderate	High.
23C*, 23D*: Gilpin	C	None	>6.0	---	---	20-40	Soft	Moderate	Low	High.
Berks	C	None	>6.0	---	---	20-40	Soft	Low	Low	High.
24C, 24D, 24E—Grimsley	B	None	>6.0	---	---	40-60	Soft	None	Low	High.
25D*, 25E*: Grimsley	B	None	>6.0	---	---	40-60	Soft	None	Low	High.
Cedarcreek	C	None	>6.0	---	---	>60	---	Moderate	Moderate	High.
Berks	C	None	>6.0	---	---	20-40	Soft	Low	Low	High.
26B, 26C, 26D, 26E—Groseclose	C	None	>6.0	---	---	>60	---	Moderate	High	High.
27B, 27C—Guernsey	C	None	1.5-3.0	Perched	Jan-Apr	>50	Soft	High	High	Moderate.
28C, 28D, 28E, 28F—Lily	B	None	>6.0	---	---	20-40	Hard	---	Moderate	High.
29D, 29E—Lily	B	None	>6.0	---	---	20-40	Hard	Moderate	Moderate	High.
30C, 30D, 31E—Madsheep	C	None	>6.0	---	---	20-40	Hard	Moderate	Low	Moderate.
32A—Melvin	D	Frequent	0-1.0	Apparent	Dec-May	>60	---	---	High	Low.

See footnote at end of table.

Table 20.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding	High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
			Ft			In				
33*-- Mine Tipples, Dumps, and Tailings	A	None	>6.0	---	---	>60	---	---	---	---
34B, 34C, 34D-- Murrill	B	None	>6.0	---	---	>60	---	Moderate	Moderate	High.
35A*:										
Newark	C	Occasional	0.5-1.5	Apparent	Dec-May	>60	---	High	High	Low.
Lindside	C	Occasional	1.5-3.0	Apparent	Dec-Apr	>60	---	High	Moderate	Low.
36F*:										
Newbern	C	None	>6.0	---	---	10-20	Hard	Moderate	Low	Low.
Rock outcrop	D	None	>6.0	---	---	0	Hard	---	---	---
37C, 37D-- Oriskany	B	None	>6.0	---	---	>60	---	Moderate	Moderate	High.
38C, 38D, 38E-- Oriskany	B	None	>6.0	---	---	>60	---	Moderate	High	Moderate.
39D*, 39E*:										
Paddyknob	A	None	>6.0	---	---	20-40	Hard	Low	Low	High.
Rock outcrop	D	None	>6.0	---	---	0	Hard	---	---	---
40D, 40E-- Paddyknob	A	None	>6.0	---	---	20-40	Hard	Low	Low	High.
41A-- Philo	B	Frequent	1.5-3.0	Apparent	Dec-Apr	>40	Hard	Moderate	Low	High.
42B, 42C, 43B, 43C-- Pisgah	C	None	>6.0	---	---	>60	---	High	High	Moderate.
44*-- Pits	---	None	>6.0	---	---	0	Hard	---	---	---
45A-- Pope	B	Rare	>6.0	---	---	>60	---	Moderate	Low	High.
46C*, 46D*:										
Poplimento	C	None	>6.0	---	---	>60	Hard	Moderate	High	Moderate.
Westmoreland	B	None	>6.0	---	---	>40	Hard	Moderate	Low	High.
47A-- Purdy	D	None	+1-1.0	Apparent	Nov-Jun	>60	---	High	High	High.
48B-- Timberville	B	None	>6.0	---	---	>60	---	Moderate	Low	High.
49B, 49C-- Tumbling	B	None	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
50*:										
Udorthents.										

See footnote at end of table.

ble 20.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding	High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
			Ft			In				
50*:										
Urban land	---	None	>2.0	---	---	>10	---	---	---	---
51D*, 51E*:										
Wallen	B	None	>6.0	---	---	20-40	Hard	Low	Low	High.
Rock outcrop	D	None	>6.0	---	---	0	Hard	---	---	---
52C, 52D, 52E----- Wallen	B	None	>6.0	---	---	20-40	Hard	Low	Low	High.
53E*, 53F*:										
Westmoreland	B	None	>6.0	---	---	>40	Hard	Moderate	Low	High.
Poplimento	C	None	>6.0	---	---	>60	Hard	Moderate	High	Moderate.
Berks	C	None	>6.0	---	---	20-40	Soft	Low	Low	High.
54A----- Wolfgap	B	Occasional	>6.0	---	---	>60	---	Moderate	Low	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 21.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Allegheny	Fine-loamy, mixed, mesic Typic Hapludults
Alticrest	Coarse-loamy, siliceous, mesic Typic Dystrochrepts
Berks	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Bland	Fine, mixed, mesic Typic Hapludalfs
Botetourt	Fine-loamy, siliceous, mesic Ultic Hapludalfs
Brushy	Loamy-skeletal, siliceous, mesic Typic Hapludults
Calvin	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Carbo	Very-fine, mixed, mesic Typic Hapludalfs
Cedarcreek	Loamy-skeletal, mixed, acid, mesic Typic Udorthents
Chiswell	Loamy-skeletal, mixed, mesic, shallow Typic Dystrochrepts
Coursey	Fine-loamy, siliceous, mesic Aquic Hapludults
Craigsville	Loamy-skeletal, mixed, mesic Fluventic Dystrochrepts
Drypond	Loamy-skeletal, siliceous, mesic Lithic Dystrochrepts
Frederick	Clayey, mixed, mesic Typic Paleudults
Gilpin	Fine-loamy, mixed, mesic Typic Hapludults
Grimsley	Loamy-skeletal, siliceous, mesic Typic Hapludults
Groseclose	Clayey, mixed, mesic Typic Hapludults
Guernsey	Fine, mixed, mesic Aquic Hapludalfs
Lily	Fine-loamy, siliceous, mesic Typic Hapludults
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Litz	Loamy-skeletal, mixed, mesic Ruptic-Ultic Dystrochrepts
Madsheep	Loamy-skeletal, siliceous, frigid Typic Dystrochrepts
Melvin	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
*Murrill	Fine-loamy, mixed, mesic Typic Hapludults
Newark	Fine-silty, mixed, nonacid, mesic Aeric Fluvaquents
Newbern	Loamy, mixed, mesic Lithic Eutrochrepts
Oriskany	Loamy-skeletal, siliceous, mesic Typic Hapludults
Paddyknob	Loamy-skeletal, siliceous, frigid Typic Dystrochrepts
Philo	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Pisgah	Fine, mixed, mesic Ultic Hapludalfs
Pope	Coarse-loamy, mixed, mesic Fluventic Dystrochrepts
Poplimento	Fine, mixed, mesic Ultic Hapludalfs
Purdy	Clayey, mixed, mesic Typic Endoaquults
Timberville	Clayey, mixed, mesic Typic Hapludults
Tumbling	Clayey, kaolinitic, mesic Typic Paleudults
Udorthents	Udorthents
Wallen	Loamy-skeletal, siliceous, mesic Typic Dystrochrepts
Weikert	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Westmoreland	Fine-loamy, mixed, mesic Ultic Hapludalfs
Wolfgap	Fine-loamy, siliceous, mesic Fluventic Hapludolls

Table 22.--Relationship of Geology to Soils

("Geologic epoch" is the geologic age of the unconsolicated deposit or the bedrock formation. Under "Deposit or formation," the dominant bedrock lithology is abbreviated as follows: ls=limestone; sh=shale; ss=sandstone; ch=chert)

Geologic period	Geologic epoch	Deposit or formation	Soil series
Quaternary	Holocene	Mine spoil	Cedarcreek
		Alluvium ss, sh	Craigsville
			Philo
			Pope
		ls, sh	Newark
			Melvin
			Lindside
		ls	Timberville
		ss, sh, ls	Wolfgap
	Late Pleistocene	Alluvium ss, sh, ls	Allegheny
			Botetourt
			Coursey
			Purdy
		Colluvium ss, sh	Grimsley
			Oriskany
			Murrill
		sh, ls	Guernsey
	Early Pleistocene	Colluvium ss	Tumbling
Pennsylvanian		Kanawha ss, sh	Lily
			Gilpin
			Berks
		New River ss, sh	Alticrest
			Berks
			Gilpin
			Lily
		Pocahontas sh,ss	Berks
			Gilpin
			Lily
			Wallen
Mississippian		Bluestone sh, ss	Berks
			Lily
			Calvin
		Hinton ss, sh	Calvin
			Lily
			Wallen
		Greenbrier ls	Carbo
			Frederick
			Newbern
		Price sh, ss	Berks
			Weikert
			Lily
			Wallen
Devonian		Chemung ss, sh	Lily
			Wallen
			Drypond
		Braillier sh	Berks
			Weikert
		Millboro sh	Berks
			Weikert
		Onadanga ls, ch	Frederick
			Brushy
Silurian		Clinch ss	Wallen
			Lily
			Paddyknob

Table 22.--Relationship of Geology to Soils--Continued

Geologic period	Geologic epoch	Deposit or formation	Soil series
Ordovician		Juniata sh, ss	Calvin
			Madsheep
		Martinsburg sh, ls	Westmoreland
			Poplimento
			Berks
			Carbo
		Moccasin ls, sh	Bland
		Holston ls	Pisgah
			Carbo
		Lenoir ls	Newbern
		Lowville ls	Carbo
		Beekmantown ls	Frederick
			Carbo
Cambrian		Copper Ridge ls	Frederick
			Carbo
		Nolichucky sh	Chiswell
			Litz
		Honaker ls	Frederick
			Carbo
		Rome sh, ls	Chiswell
			Litz
			Groseclose
			Carbo