United States
Department of
Agriculture

Soil Conservation
Service

In Cooperation with
United States
Department of
Agriculture, Forest
Service, and Virginia
Polytechnic Institute
and State University

Soil Survey of Rockingham County Virginia

HOW TO USE

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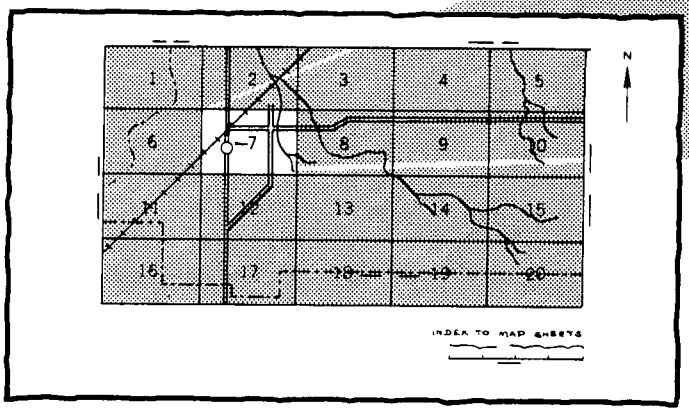

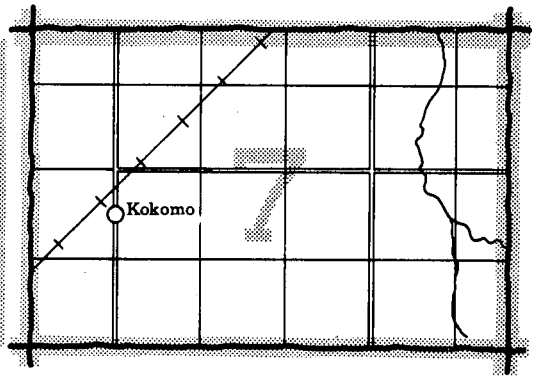

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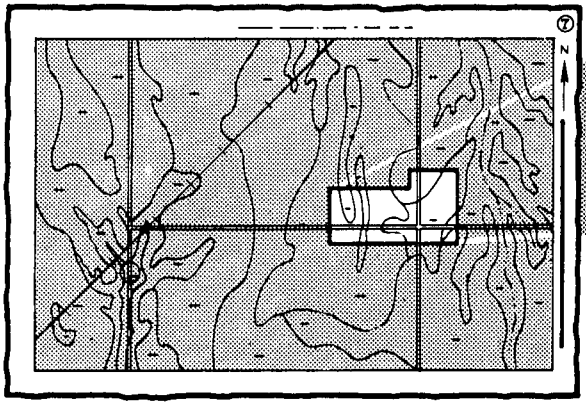

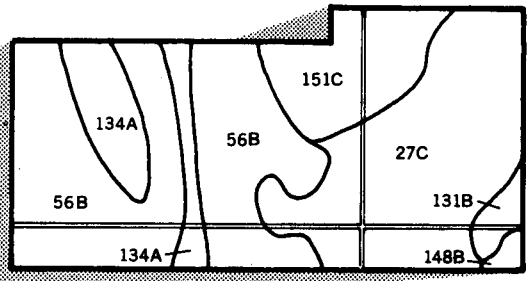

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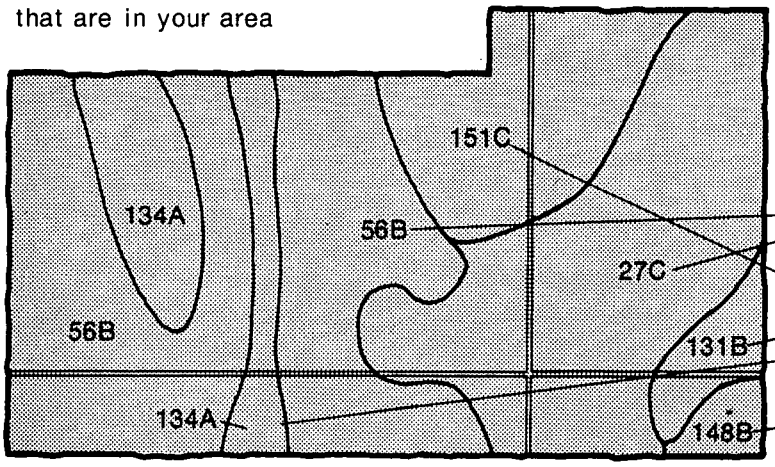

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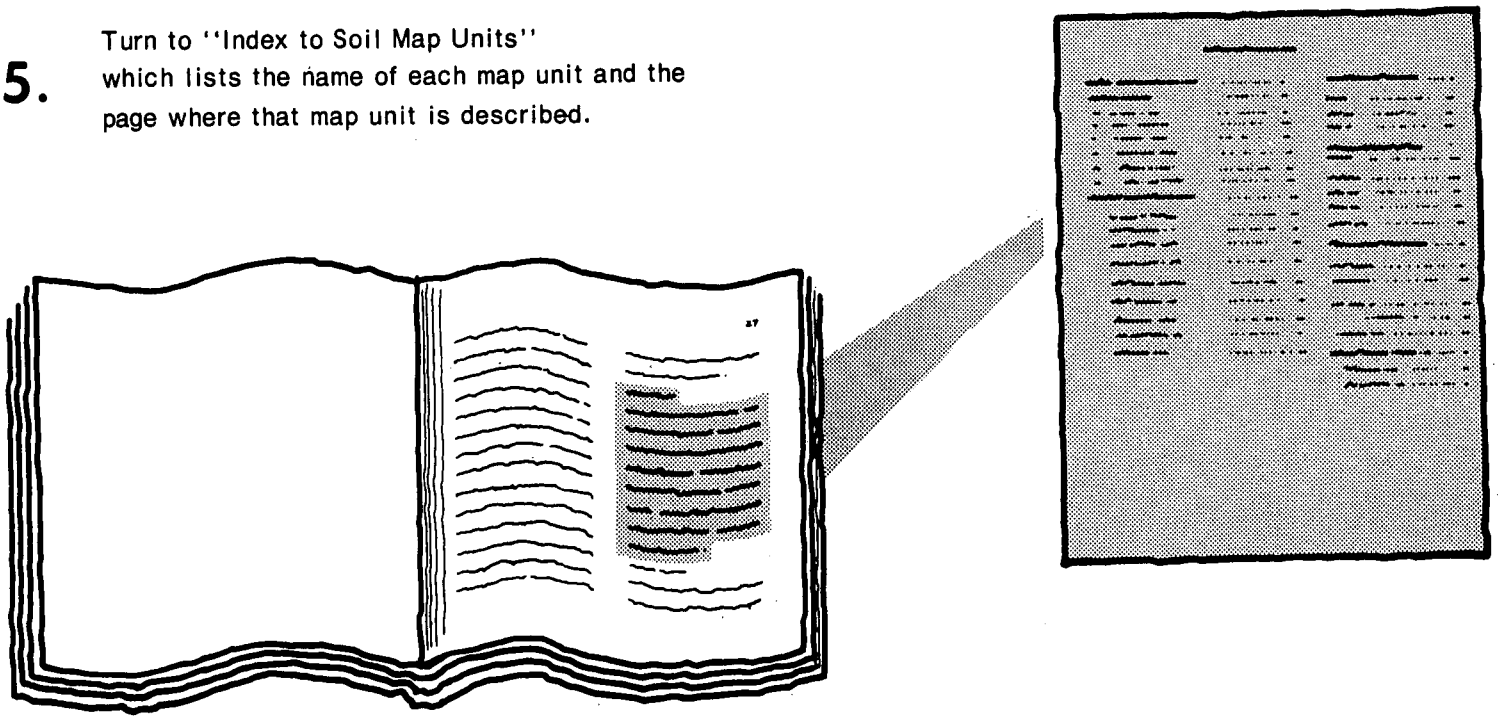
THIS SOIL SURVEY

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



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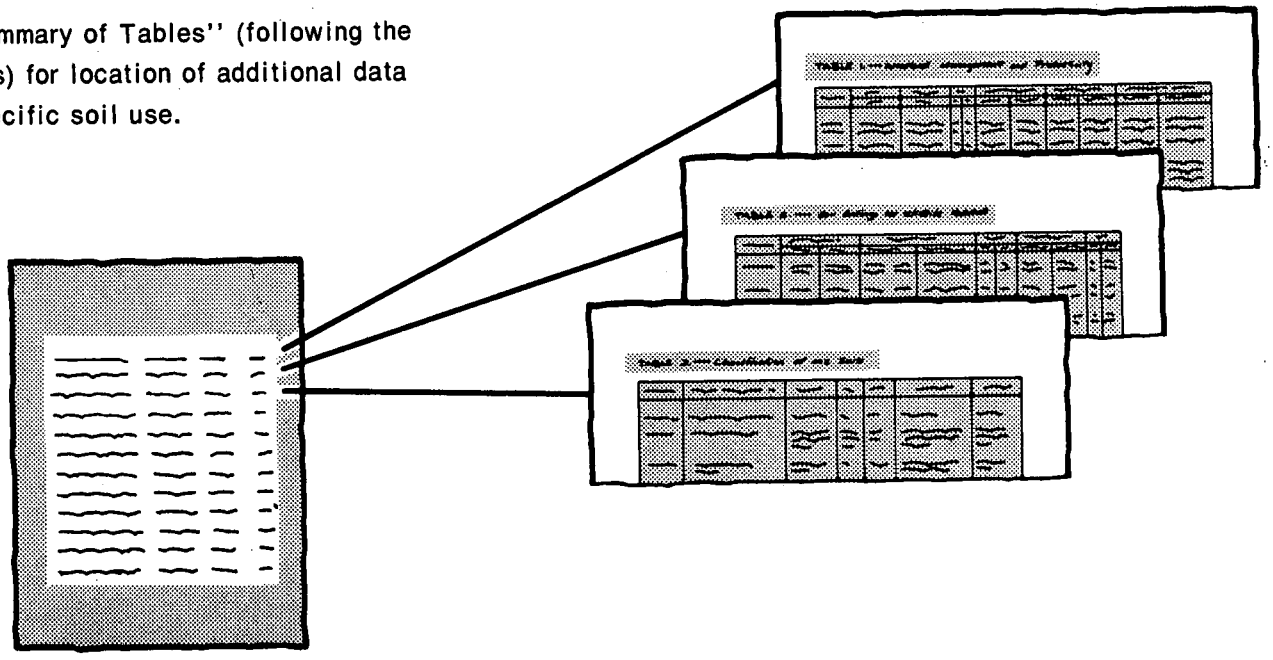

7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists,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

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

Major fieldwork for this soil survey was performed in the period 1970-76. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service, the Forest Service, the Virginia Polytechnic Institute and State University, and the Rockingham County Board of Supervisors. The survey is part of the technical assistance furnished to the Shenandoah Valley Soil and Water Conservation District.

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

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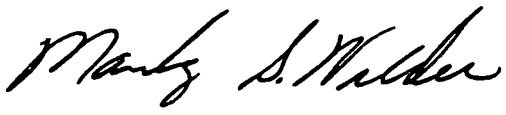
foreword

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

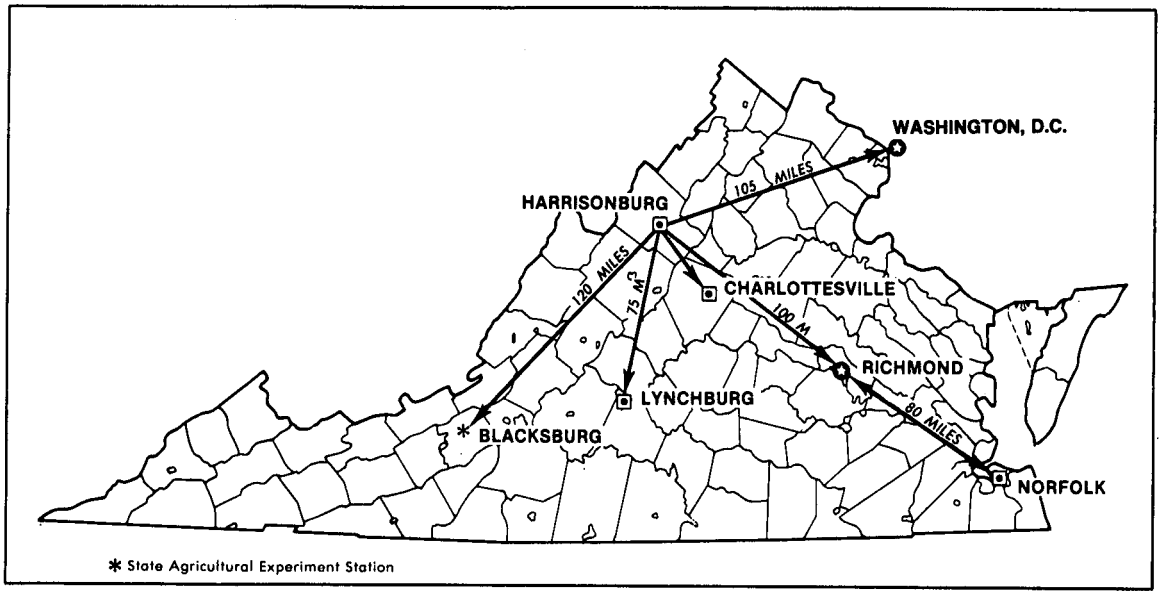
This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use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

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

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



Manly S. Wilder
State Conservationist
Soil Conservation Service



Location of Rockingham County in Virginia.

soil survey of
Rockingham County, Virginia

By John R. Hockman, Charles F. Neal, David L. Racey, and
David F. Wagner, Soil Conservation Service

United States Department of Agriculture, Soil Conservation
Service and Forest Service
in cooperation with the
Virginia Polytechnic Institute and State University

ROCKINGHAM COUNTY is the third largest county in Virginia and has an area of 868 square miles, or 555,520 acres. The population of the county in 1975 was 52,500. Much of the population is near Harrisonburg, the county seat. The county is in the northwestern part of the State. Most of Rockingham County is in the Valley and Ridge province; the eastern edge of the county is the Blue Ridge province. The lowest point, near Elkton, is about 900 feet above sea level. The highest point is at Flagpole Knob in the Appalachians, 4,381 feet above sea level.

The county has two mountain ranges, the Appalachian Mountains to the west and the Blue Ridge Mountains to the east. Both ranges are marked by deep valleys, steep slopes, and narrow ridges, locally called hogbacks. Between the mountain ranges is the 20-mile-wide, gently rolling Great Limestone Valley. The Massanutten Mountain, which rises abruptly to a point about 1,800 feet above the valley floor, is between the Great Limestone Valley and the northern boundary of the county. The southern part of the county and the area east of the Massanutten Mountain is drained by the North River and South Fork of the Shenandoah River. The rest of the county is drained by the North Fork of the Shenandoah River.

The soils in the county have formed in a wide variety of materials: residuum from sedimentary rocks such as limestone and dolomite and shale or sandstone; residuum from metamorphosed rocks such as phyllite, greenstone, and quartzite; and colluvial and alluvial materials from areas underlain by all of these rocks.

About 32 percent of the county is publicly owned. The mountainous areas in the western part of the county and a large part of the Massanutten Mountain are in the George Washington National Forest, which is approximately 140,000 acres. The Shenandoah National Park extends the length of the Blue Ridge along the eastern side of the county. Skyline Drive winds through the Shenandoah National Park along the county boundary and connects with U.S. Route 33 east of Elkton.

general nature of the county

This section provides data on the climate of the county and describes some of the major geological features and sources of water.

climate

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

Table 1 gives data on temperature and precipitation for the survey area as recorded at Dale Enterprise, Virginia, in the period 1951 to 1975. 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 34 degrees F, and the average daily minimum temperature is 24 degrees. The lowest temperature on record, which occurred at Dale Enterprise on January 28, 1961, is -12 degrees. In summer the average temperature is 72 degrees, and the average daily maximum temperature is 84 degrees. The highest recorded temperature, which

occurred at Dale Enterprise on July 3, 1966, is 100 degrees.

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

The total annual precipitation is 34 inches. Of this, 20 inches, or 60 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 16 inches. The heaviest 1-day rainfall during the period of record was 4.70 inches at Dale Enterprise on October 15, 1954. Thunderstorms occur on about 40 days each year, and most occur in summer.

Average seasonal snowfall is 28 inches. The greatest snow depth at any one time during the period of record was 24 inches. On an average of 13 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 50 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southeast. Average windspeed is highest, 10 miles per hour, in spring.

geology and water supplies

The bedrock in the county ranges in age from Mississippian in the western part to Precambrian in the eastern part but is mainly Cambrian, Ordivician, and Devonian. The bedrock consists of three major groups of rocks: (1) the metamorphic rocks, such as quartzite, phyllite, and greenstone, along the Blue Ridge Mountains; (2) sedimentary shale, limestone, and dolomite that are dominant in the valley areas; (3) sedimentary sandstone and shale that are dominant in the Appalachian Mountains and on Massanutten Mountain.

The largest sources of ground water are in the limestone areas in the form of large, free-flowing springs, but the fractured and cavernous nature of the limestone causes a hazard of pollution to wells and springs. The supply from surface wells generally is difficult to locate and erratic. The numerous sinkholes throughout the limestone areas contribute in part to surface runoff to underground water supplies. The shale areas in the county produce small but consistent wells, but the ground water in the sandstone areas is largely concentrated in fracture zones which are difficult to locate.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils mainly on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. Most of the soil maps at the back of this publication were prepared from aerial photographs. Because of expected land use, the soils in the publicly owned land in Rockingham County were observed at greater intervals than were the soils in other parts of the county, and in some instances the soil boundaries were placed by stereoscopic examination.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, and woodland managers, engineers, planners, developers and builders, home buyers, and others.

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, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where 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.

soils in the main valley formed in residual material weathered from limestone, dolomite, and calcareous shale

1. Frederick-Lodi-Rock outcrop

Deep, gently sloping to steep, well drained soils that have a clayey subsoil and areas of rock outcrop; on uplands underlain by limestone and dolomite bedrock

These soils are extensive throughout the Great Limestone Valley. The unit occupies about 26 percent of the county. It is about 35 percent Frederick soils, 25 percent Lodi soils, 10 percent rock outcrops, and 30 percent soils of minor extent.

The Frederick and Lodi soils are dominantly gently sloping and sloping. Both soils have a surface layer of silt loam and are closely intermingled on the landscape. The rock outcrops, which consist of limestone or dolomite, are mainly less than 30 feet apart and are dominantly in steep areas.

The minor soils in this unit are well drained Endcav, Shenval, and Timberville Variant soils, moderately well drained Nixa soils and Aquic Udifluvents, and somewhat poorly drained to poorly drained Fluvaquents.

This unit is mainly used and generally suitable for crops and pasture. The steep and rocky areas are in pasture, hay, or woodland. Slope, stones in and on the soils, and the permeability of the soils are the main limitations of the unit.

2. Endcav-Carbo-Rock outcrop

Deep and moderately deep, gently sloping to moderately steep, well drained soils that have a clayey subsoil; on uplands underlain by limestone bedrock

These soils are in the Great Limestone Valley. The unit occupies about 4 percent of the county. It is about 45 percent Endcav soils, 18 percent Carbo soils, 15 percent limestone rock outcrops, and 22 percent soils of minor extent.

Some of the Endcav soils are rocky. The depth to bedrock is about 60 inches in the Endcav soils and 30 inches in the Carbo soils. The subsoil of both soils has a high shrink-swell potential. The rock outcrops are mainly less than 30 feet apart. Sinkholes are common in this unit.

The minor soils in this unit are well drained Edom, Frederick, Chilhowie, and Timberville Variant soils, moderately well drained to somewhat poorly drained Aquic Udifluvents, and somewhat poorly drained to poorly drained Fluvaquents.

Most areas of this unit are farmed. The wooded areas consist of oak and hickory or eastern redcedar. The areas of rock outcrop, flooding along drainageways and small streams, the depth to bedrock in the Carbo soils, and the shrink-swell potential are the main limitations of the unit.

3. Chilhowie-Edom

Moderately deep to deep, gently sloping to steep, well drained soils that have a clayey subsoil; on uplands underlain by limestone and interbedded shale

These soils are throughout the main valley section of the county. The unit occupies about 6 percent of the county. It is about 46 percent Chilhowie soils, 39 percent Edom soils, and 15 percent soils of minor extent.

The Chilhowie soils are moderately deep. They generally are on narrow ridgetops and short, steep side slopes. The Edom soils are deep. They are mainly on long, gently rolling to rolling slopes and broad ridgetops. Small rock outcrops are in the areas of the Chilhowie soils.

The minor soils in this unit are well drained Endcav soils, moderately well drained Guernsey soils, and somewhat poorly drained to poorly drained Fluvaquents.

This unit is used mainly for crops and pasture. Most of the steep, rocky, or rough areas are wooded. Slope, rocks on the surface, and the depth to bedrock are the main limitations of the unit.

soils in the main valley formed in residual material weathered from shale and thin interbedded sandstone and limestone

4. Berks-Sequoia-Weikert

Shallow to moderately deep, gently sloping to steep, well drained soils that have a loamy or clayey subsoil; on uplands underlain by shale

These soils are in the main valley section of the county. The unit occupies about 3 percent of the county. It is about 30 percent Berks soils, 25 percent Sequoia soils, 15 percent Weikert soils, and 30 percent soils of minor extent.

The Berks soils are moderately deep and shaly. They are on ridgetops and side slopes. The Sequoia soils are moderately deep and clayey. They are on the more nearly level parts of the ridgetops. The Weikert soils are shallow and shaly. They are on short, steep side slopes of ridges.

The minor soils in this unit are somewhat poorly drained to moderately well drained Aquic Udifluvents, moderately well drained Massanetta and Guernsey soils, poorly drained to somewhat poorly drained Fluvaquents, and very shaly areas and shale outcrops that are mostly mixed with the Berks and Weikert soils.

This unit is used mainly for pasture, but some areas are used for cultivated crops or are in woodland. Droughtiness, the depth to bedrock, and slope are the main limitations.

soils on the Appalachian Mountains, Blue Ridge Mountains, and Massanutten Mountain that formed in residual or colluvial material weathered from sandstone, shale, or greenstone

5. Laidig-Buchanan-Berks

Moderately deep to deep, gently sloping to steep, well drained to somewhat poorly drained soils that have a loamy subsoil; on uplands of colluvial and residual material

These soils are on lower side slopes, toe slopes, and colluvial fans. The unit occupies about 4 percent of the county. It is about 30 percent Laidig soils, 25 percent Buchanan soils, 25 percent Berks soils, and 20 percent soils of minor extent.

The Laidig soils are deep and well drained. They generally are on the lower mountain slopes. The Buchanan soils are deep and somewhat poorly drained. They are on toe slopes and colluvial fans. The Berks soils are well drained and moderately deep. They are on steep side slopes of knolls and drainageways.

The minor soils in this unit are well drained Sequoia, Shelocta Variant, and Weikert soils.

This unit is mostly in woodland or pasture. Much of the unit is in the George Washington National Forest. Most of the acreage is too stony or too steep for cultivated crops, but some areas on the lower foot slopes are used for farming.

6. Laidig-Drall

Deep, sloping to very steep, well drained to excessively drained soils that have a loamy or sandy subsoil; on mountainous uplands

These soils are on the side slopes and tops of mountains mostly in the George Washington National Forest. The unit occupies about 3 percent of the county. It is about 65 percent Laidig soils, 20 percent Drall soils, and 15 percent soils of minor extent.

The Laidig soils are well drained. They are on the lower mountain side slopes, on toe slopes, and on colluvial fans along the base of the mountain. The Drall soils are excessively drained. They are on the upper side slopes and along the mountaintops. Most areas of these soils are very stony or extremely stony.

The minor areas in this unit are well drained Frederick, Lodi, and Berks soils, somewhat poorly drained Buchanan soils, and rock outcrops.

This unit is mostly in woodland. A few small areas are used for pasture. Stones on the surface and slope are the main limitations for most uses.

7. Weikert-Berks

Shallow to moderately deep, sloping to very steep, well drained soils that have a loamy subsoil; on mountainous uplands underlain by shale

These soils are mostly in the George Washington National Forest. They are on the side slopes and tops of the Appalachian Mountains. This unit occupies about 17 percent of the county. It is about 37 percent Weikert soils, 32 percent Berks soils, and 31 percent soils of minor extent.

The Berks soils are moderately deep and are in the more nearly level, smoother areas. The Weikert soils are shallow and are in the more sloping areas.

The minor soils in this unit are well drained Typic Udorthents and Laidig and Craigsville soils and moderately well drained Guernsey soils.

This unit is mostly in woodland. A few small areas, mostly on flood plains, have been cleared and are used for pasture and cultivated crops. Slope, stones on the

surface, and the depth to bedrock are the main limitations for most uses.

8. Lehew-Dekalb-Calvin

Moderately deep, sloping to very steep, well drained soils that have a loamy subsoil; on mountainous uplands

These soils are on the side slopes and mountaintops of the Appalachian Mountains in the George Washington National Forest. The unit occupies about 18 percent of the county. It is about 23 percent Lehew soils, 21 percent Dekalb soils, 18 percent Calvin soils, and 38 percent soils of minor extent.

The Lehew, Dekalb, and Calvin soils are throughout the unit. They have stones on the surface and stone fragments throughout the soil.

The minor soils in this unit are somewhat excessively drained Drall soils and well drained Typic Udorthents and Berks and Weikert soils.

This unit is mostly wooded. A few areas along the mountaintops have been cleared and are used for pasture. Stones on the surface, the depth to bedrock, and slope are the main limitations.

9. Drall-Laidig

Deep, sloping to very steep, well drained to excessively drained soils that have a sandy or loamy subsoil; on mountainous uplands

These soils are on the upper slopes and tops of the Massanutten Mountain and on the side slopes and outlying ridges of the Blue Ridge Mountains. Much of this unit is in the Shenandoah National Park and the George Washington National Forest. The unit occupies about 6 percent of the county. It is about 65 percent Drall soils, 20 percent Laidig soils, and 15 percent soils of minor extent.

The Drall soils are excessively drained and have an extremely stony surface. They are on the side slopes and tops of the mountains and are droughty in summer. The Laidig soils are well drained and have a cobbly or very stony surface layer. They are on the lower side slopes and toe slopes.

The minor areas are well drained Sylco, Berks, and Sequoia soils and rock outcrops and areas of Allegheny and Buchanan soils along the foot slopes of the mountains.

Most areas in this unit are wooded. A small acreage is cleared and used for pasture. Slope and stones on the surface are the main limitations.

10. Sylco-Myersville-Fauquier

Moderately deep to deep, sloping to very steep, well drained soils that have loamy or clayey subsoil; on mountainous uplands

These soils are mostly on the Blue Ridge Mountains in the Shenandoah National Park. The unit occupies about 5 percent of the county. It is about 45 percent Sylco soils, 28 percent Myersville soils, 15 percent Fauquier soils, and 12 percent soils of minor extent.

The Sylco and Myersville soils are on the mountaintops and upper side slopes. The Fauquier soils are on the lower mountain side slopes and toe slopes. The Sylco soils are droughty in summer.

The minor areas in this unit are excessively drained Drall soils, well drained Hawksbill soils, Udorthents, and rock outcrops and rubble.

This unit is mostly wooded. A few small areas are used for pasture. Boulders and stones on the surface and slope are the main limitations.

soils on river terraces that formed in alluvial or colluvial material

11. Monongahela-Unison-Cotaco

Deep, nearly level to moderately steep, well drained or moderately well drained soils that have a loamy or clayey subsoil; on terraces adjacent to streams and rivers

These soils are on terraces along the North River and the North Fork and South Fork of the Shenandoah River. The unit occupies about 8 percent of the county. It is about 23 percent Monongahela soils, 14 percent Unison soils, 10 percent Cotaco soils, and 53 percent soils of minor extent.

The Monongahela and Cotaco soils are moderately well drained and are at a slightly lower elevation than the well drained Unison soils. The Monongahela and Cotaco soils have a seasonal high water table.

The minor soils in this unit are well drained Allegheny, Chavies, Hawksbill, and Shenval soils and Typic Udorthents; moderately well drained Burketown soils; and poorly drained Purdy soils.

This unit is used mainly for crops and pasture. A moderate acreage is wooded. The seasonal high water table in the Monongahela and Cotaco soils and the slope of the Unison soils are the main limitations. Flooding is a hazard on some of the minor soils.

detailed soil map units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, *Edom silty clay loam, 7 to 15 percent slopes, eroded,* is one of several phases in the Edom series.

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

A *soil complex* consists of two or more soils, or one or more soils and non-soil, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. *Rock outcrop-Carbo complex, 0 to 20 percent slopes,* is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. *Frederick and Lodi silt loams, 2 to 7 percent slopes, eroded,* is an undifferentiated group in this survey area.

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

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

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

1B—Allegheny fine sandy loam, 1 to 7 percent slopes. This soil is deep, gently sloping, and well drained. It is on river terraces adjacent to the larger streams. Areas of this soil are commonly long and narrow. They range from 3 to 150 acres.

Typically, the surface layer of this soil is dark yellowish brown fine sandy loam about 9 inches thick. The subsoil is strong brown and is about 23 inches thick. It is loam in the upper part and sandy clay loam in the lower part. The substratum to a depth of 54 inches is strong brown or yellowish brown sandy loam that contains a few sandstone cobblestones. At a depth of more than 54 inches, it is stratified layers of sand, gravel, and cobblestones.

Included with this soil in mapping are small intermingled areas of Chavies, Monongahela, and Shenval soils. The Chavies soils are on the lower areas near flood plains. The Monongahela soils are in depressions on the terraces and at the heads of drainageways. The Shenval soils are on the higher areas near uplands. Also included are spots of gravelly and cobbly soils along shallow drainageways. Included soils make up about 10 to 25 percent of the unit.

The permeability of this Allegheny soil is moderate, and the available water capacity is moderate. Surface runoff is slow. Tilth is good, but the soil is low in natural fertility and organic matter content. The subsoil has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas are commonly strongly acid to very strongly acid.

This soil is suited to cultivated crops and to pasture and hay. Most areas are farmed. The use of lime and fertilizer helps to offset the acidity and low natural fertility of the soil. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to increase fertility and organic matter content in cultivated areas. Crop residue kept on or in the surface layer helps to maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the major pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and use of lime and fertilizer are practices that help to increase carrying capacity of pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. The potential productivity is high. The soil is managed mostly for white pine.

This soil is generally suitable for most types of community development, but ground-water pollution is a hazard in areas used for septic tank absorption fields.

The capability subclass is IIe.

2B—Allegheny cobbly fine sandy loam, 1 to 7 percent slopes. This soil is deep, gently sloping, and well drained. It is on river terraces typically adjacent to mountain foot slopes and is along streams. Areas of this soil are commonly long and narrow. They range from 10 to 100 acres.

Typically, the surface layer of this soil is dark yellowish brown cobbly fine sandy loam about 9 inches thick. The subsoil is strong brown and is about 23 inches thick. It is loam in the upper part and sandy clay loam in the lower part. The substratum to a depth of 54 inches is strong brown to yellowish brown sandy loam that contains a few sandstone cobblestones. At a depth of more than 54 inches, it is stratified layers of sand, gravel, and cobblestones.

Included with this soil in mapping are small intermingled areas of Craigsville, Monongahela, and Laidig soils. The Craigsville and Laidig soils are commonly near the adjacent uplands. The Monongahela soils are typically in depressional or level areas on the terraces. Included soils make up about 10 to 20 percent of the unit.

The permeability of this Allegheny soil is moderate, and the available water capacity is moderate. Surface runoff is slow. Tilth is fair, but the soil is low in natural fertility and content of organic matter. The subsoil has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas are commonly strongly acid to very strongly acid.

This soil is suited to cultivated crops and to pasture and hay. Most areas are farmed. The main limitation is cobblestones on the surface, which hinder tillage and seeding. The use of lime and fertilizer helps to offset the acidity and low natural fertility of the soil. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to increase fertility and organic matter content in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the major pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and use of lime and fertilizer are practices that help to increase the carrying capacity of pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed mostly for white pine.

This soil is generally suitable for most types of community development, but ground-water pollution is a hazard in areas used for septic tank absorption fields.

The capability subclass is IIIe.

3B—Allegheny-Monongahela fine sandy loams, 0 to 7 percent slopes. This unit consists of nearly level to gently sloping, well drained and moderately well drained soils on smooth, broad terraces adjacent to the flood plains of the larger streams and rivers. The areas of this unit are irregular in shape or are long and winding. They range from about 5 to 100 acres and consist of about 50 percent Allegheny soils, 35 percent Monongahela soils, and 15 percent other soils. The Allegheny and Monongahela soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Allegheny soils is dark yellowish brown fine sandy loam about 9 inches thick. The subsoil is strong brown and is about 23 inches thick. The upper part of the subsoil is loam, and the lower part is sandy clay loam. The substratum to a depth of 54 inches is a strong brown to yellowish brown sandy loam that contains a few sandstone cobblestones. At a depth of more than 54 inches, it is stratified layers of sand, gravel, and cobblestones.

The surface layer of the Monongahela soils is brown fine sandy loam about 10 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 14 inches of the subsoil is pale brown and yellowish brown loam that is mottled in the lower part. The middle part is a dense, brittle layer of mottled, pale brown loam 9 inches thick. The lower part is mottled, strong brown clay loam, yellowish red clay loam, and red clay.

Included with these soils in mapping are small intermingled areas of Unison, Buchanan, and Purdy soils

that make up about 10 percent of the unit. The Unison soils are commonly on the higher areas near the uplands. The Buchanan and Purdy soils are in depressions and at the heads of drainageways. Also included are a few sinkholes, small wet spots, and small gravelly and cobbly areas that make up about 5 percent of the unit.

These Allegheny soils have moderate permeability, and the Monongahela soils have moderately slow permeability. The available water capacity of both soils is moderate or low. Surface runoff is slow to medium. Tilth is good, but both soils are low in natural fertility and organic matter content. The root zone extends to a depth of about 60 inches in the Allegheny soils but is restricted to a depth of about 24 inches in the Monongahela soils because of the dense, brittle part of the subsoil. A seasonal high water table is perched on the brittle part of the subsoil in winter and spring. The surface layer and subsoil in unlimed areas of these soils are commonly strongly acid to very strongly acid.

These soils are suited to cultivated crops and to pasture and hay. Most areas are farmed. Alfalfa is short lived on the Monongahela soils because of seasonal wetness and restricted root growth, and the Monongahela soils commonly are droughty during the growing season. The hazard of erosion is slight to moderate on these soils and is a management concern. The use of lime and fertilizer helps to offset the acidity and low natural fertility of the soils. Minimum tillage and use of cover crops and grasses and legumes in the cropping system are practices that help to increase fertility and organic matter content. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are major pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and use of lime and fertilizer are the main pasture management practices that help to control erosion.

The soils are suited to trees, but only a small acreage is wooded. Potential productivity is moderately high to high. The soils are managed mostly for pine and hardwoods.

The moderately slow permeability and seasonal high water table of the Monongahela soils are the main limitations of the unit for community development.

The capability subclass is IIw.

4A—Aquic Udifluvents, nearly level. This unit consists of moderately well drained to somewhat poorly drained, nearly level soils at the heads of and along narrow drainageways and in depressional areas adjacent to streams.

The color and texture of these soils is variable, ranging from yellowish brown to gray and from loam to clay. The soils are mottled at a depth of about 18 inches.

These soils are slightly acid to mildly alkaline and have high natural fertility and high organic matter content. The lower part of the soils has moderate to slow permeability, and the available water capacity is medium to high. Runoff is slow on these soils, and they receive seepage and runoff from surrounding higher areas. A seasonal high water table is mostly between depths of 1-1/2 and 2-1/2 feet, and many areas are briefly flooded.

Most of the acreage of these soils is used for pasture, and the soils are well suited to bluegrass. A few areas are cultivated, and a very small acreage is in woodland. Flooding and seasonal wetness are the main limitations of the soils in this unit for most types of farm and nonfarm use.

The capability subclass is IIw.

5C2—Berks-Weikert shaly silt loams, 7 to 15 percent slopes, eroded. This unit consists of sloping, well drained soils on convex knolls adjacent to narrow ridges and on side slopes. Shallow drainageways 50 to 200 feet apart cross many of the larger areas. The areas of the unit are typically long and winding and range from about 5 to 50 acres. They are about 55 percent Berks soils, 25 percent Weikert soils, and 20 percent other soils. The Berks and Weikert soils are so intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Berks soils is yellowish brown shaly silt loam about 6 inches thick. The subsoil is yellowish brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam to a depth of 31 inches. Shale bedrock is at a depth of 31 inches.

The surface layer of the Weikert soils is yellowish brown shaly silt loam about 7 inches thick. The subsoil is pale brown very shaly silt loam to a depth of 14 inches. Shale bedrock is at a depth of 14 inches (fig. 1).

Included with these soils in mapping are small intermingled areas of well drained Sequoia soils that make up about 15 percent of the unit. Also included are small wet areas along drainageways, small areas of exposed bedrock on ridges, and small areas of soils that are not shaly. These areas make up about 5 percent of the unit.

Permeability is moderate in the Berks soils and moderately rapid in the Weikert soils. The available water capacity of both soils is very slow. Runoff is medium to rapid. Tilth is fair. Both soils are low in natural fertility and content of organic matter. The root zone extends to a depth of about 25 inches in the Berks soils and 14 inches in the Weikert soils. The surface layer and subsoil of unlimed areas of these soils are commonly strongly acid or very strongly acid. Rippable bedrock is at a depth of 1-1/2 to 3-1/2 feet in the Berks soils. Hard bedrock is at a depth of 1 to 1-1/2 feet in the Weikert soils.

Figure 1.—Shale bedrock in an area of Berks-Weikert shaly silt loams, 7 to 15 percent slopes, eroded.

A severe erosion hazard and droughtiness during the growing season make these soils poorly suited to cultivated crops. The soils are moderately well suited to pasture and hay, and much of the acreage is used for grazing. Establishing and maintaining a mixture of grasses and legumes and prevention of overgrazing are major pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer help to maintain pastures and control erosion.

This unit is suited to trees, and a moderate acreage is wooded. Potential productivity is moderately high. The soils are managed mostly for pine.

The depth to shale bedrock and slope are the main limitations of this unit for community development.

The capability subclass is IVe.

5D2—Berks-Weikert shaly silt loams, 15 to 25 percent slopes, eroded. This unit consists of moderately steep, well drained soils on side slopes of hills and ridges. Shallow drainageways 50 to 200 feet apart cross many of the larger areas. The areas of the unit are long and winding and range from about 3 to 100 acres. They are about 50 percent Berks soils, 35 percent Weikert soils, and 15 percent other soils.

Typically, the surface layer of the Berks soils is yellowish brown shaly silt loam about 6 inches thick. The subsoil is yellowish brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam to a depth of 31 inches. Shale bedrock is at a depth of 31 inches.

The surface layer of the Weikert soils is yellowish brown shaly silt loam about 4 inches thick. The subsoil is pale brown very shaly silt loam to a depth of 11 inches. Shale bedrock is at a depth of 11 inches.

Included with these soils in mapping are small intermingled areas of Sequoia and Laidig soils that make up about 10 percent of the unit. The Sequoia soils are on benches and the more nearly level parts of the ridgetops, and the Laidig soils are along the base of the ridge. Also included are small wet areas along the drainageways, small areas of exposed bedrock on ridges, and small areas of soils that are not shaly. These areas make up about 5 percent of the unit.

Permeability is moderate in the Berks soils and moderately rapid in the Weikert soils. The available water capacity of both soils is very low. Surface runoff is rapid. Tilth is fair. Both soils are low in natural fertility and content of organic matter. The root zone extends to a depth of about 24 inches in the Berks soils and 11 inches in the Weikert soils. The surface layer and subsoil of unlimed areas of these soils are commonly strongly acid or very strongly acid. Rippable bedrock is at a depth of 1-1/2 to 3-1/2 feet in the Berks soils. Hard bedrock is at a depth of 1 to 1-1/2 feet in the Weikert soils.

A severe erosion hazard and droughtiness during the growing season make these soils poorly suited to cultivated crops. The soils are moderately well suited to pasture and hay, and much of the acreage is used for grazing. Establishing and maintaining a mixture of grasses and legumes and prevention of overgrazing are major pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer help to maintain pastures and control erosion.

This complex is suited to trees, and a moderate acreage is wooded. Potential productivity is moderately high on north-facing slopes and moderate on south-facing slopes. The soils are managed mostly for pine.

The depth to shale bedrock and slope are the main limitations of this unit for community development.

The capability subclass is VIe.

6C2—Berks-Weikert very stony silt loams, 7 to 15 percent slopes, eroded. This unit consists of sloping, well drained soils on ridgetops and mountaintops in the Allegheny Mountains. The areas are long and winding and range from about 10 to 30 acres. Sandstone and quartzite stones cover about 3 percent of the surface. This unit is about 65 percent Berks soils, 25 percent

Weikert soils, and 10 percent other soils. The Berks and Weikert soils are so intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Berks soils is yellowish brown shaly silt loam about 6 inches thick. The subsoil is yellowish brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam to a depth of 31 inches. Shale bedrock is at a depth of 31 inches.

The surface layer of the Weikert soils is yellowish brown shaly silt loam about 7 inches thick. The subsoil is pale brown very shaly silt loam to a depth of 14 inches. Shale bedrock is at a depth of 14 inches.

Included with these soils in mapping are small intermingled areas of Sequoia and Calvin soils that make up about 5 percent of this unit. Also included are small wet areas along drainageways, small areas of exposed bedrock, and a few extremely stony spots. These areas make up about 5 percent of the unit.

Permeability is moderate in the Berks soils and moderately rapid in the Weikert soils. The available water capacity of both soils is very low. Runoff is medium to rapid. Tilth is fair. Both soils are low in natural fertility and content of organic matter. The root zone extends to a depth of about 25 inches in the Berks soils and 14 inches in the Weikert soils. The surface layer and subsoil of unlimed areas of these soils are commonly strongly acid or very strongly acid. Rippable bedrock is at a depth of 1-1/2 to 3-1/2 feet in the Berks soils. Hard bedrock is at a depth of 1 to 1-1/2 feet in the Weikert soils.

A severe erosion hazard, the stones on the surface, and droughtiness during the growing season make these soils poorly suited to cultivated crops. Areas that have been cleared of stones are moderately well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This unit is suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soils are managed mostly for pine.

Slope and the depth to bedrock are the main limitations of these soils for community development.

The capability subclass is VIs.

6D2—Berks-Weikert very stony silt loams, 15 to 25 percent slopes, eroded. This unit consists of moderately steep, well drained soils on mountaintops and upper side slopes. Shallow drainageways 50 to 200 feet apart cross many of the larger areas. The areas are long and winding and range from about 5 to 50 acres. Sandstone and quartzite stones cover about 3 percent of the surface. The unit is about 55 percent Berks soils, 35 percent Weikert soils, and 10 percent other soils.

Typically, the surface layer of the Berks soil is yellowish brown shaly silt loam about 6 inches thick. The subsoil is yellowish brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam to a depth of 31 inches. Shale bedrock is at a depth of 31 inches.

The surface layer of the Weikert soils is yellowish brown shaly silt loam about 7 inches thick. The subsoil is pale brown very shaly silt loam to a depth of 14 inches. Shale bedrock is at a depth of 14 inches.

Included with these soils in mapping are small intermingled areas of Sequoia and Calvin soils that make up about 5 percent of this unit. Also included are small wet areas along drainageways, small areas of exposed bedrock on ridges, and spots of extremely stony soils. These areas make up about 5 percent of the mapping unit.

Permeability is moderate in the Berks soils and moderately rapid in the Weikert soils. The available water capacity of both soils is very low. Runoff is medium to rapid. Tilth is fair. Both soils are low in natural fertility and content of organic matter. The root zone extends to a depth of about 25 inches in the Berks soils and 14 inches in the Weikert soils. The surface layer and subsoil of unlimed areas of these soils are commonly strongly acid or very strongly acid. Rippable bedrock is at a depth of 1-1/2 to 3-1/2 feet in the Berks soils. Hard bedrock is at a depth of 1 to 1-1/2 feet in the Weikert soils.

Slope, the stones on the surface, and droughtiness during the growing season make these soils generally unsuitable for cultivated crops. The soils are suited to pasture if the stones are removed.

These soils are suited to trees, and a large acreage is wooded. Potential productivity is moderately high on north-facing slopes and moderate on south-facing slopes. The soils are managed mostly for pine.

Slope and the depth to bedrock are the main limitations of the soils for community development.

The capability subclass is VIIs.

7A—Buchanan silt loam, 0 to 5 percent slopes. This soil is nearly level to gently sloping, deep, and somewhat poorly drained. It is on broad terraces along the rivers and major streams. The areas of this soil commonly are irregular in shape and range from 3 to 75 acres.

Typically, the surface layer is yellowish brown silt loam about 7 inches thick. The upper part of the subsoil is yellowish brown loam and mottled sandy clay loam 14 inches thick. The lower part of the subsoil is 21 inches thick. It is a brittle and compact layer of mottled, light yellowish brown fine sandy loam and sandy loam. The substratum is mottled, yellowish brown clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Monongahela, Purdy, Allegheny, and Chavies soils that make up about 20 percent of this

unit. Also included are spots of soils with a cobbly surface layer that make up about 5 percent of the unit.

The permeability of this Buchanan soil is moderate above the brittle, compact part of the subsoil and slow in the brittle part. The available water capacity of the soil is moderate. Surface runoff is slow. A seasonal high water table is perched on the lower part of the subsoil in winter and spring. Tilth of the soil is good, but the soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone is restricted to a depth of about 21 inches by the lower part of the subsoil. The surface layer and subsoil in unlimed areas are commonly very strongly acid or strongly acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth. Droughtiness during the growing season and a moderate hazard of erosion are the main farm management concerns. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept in or on the surface layer helps to prevent surface crusting.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are major pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer are management practices that help to maintain pastures and control erosion. Grazing during periods of seasonal wetness often cuts and compacts the surface layer, increasing the hazard of erosion.

This soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

Seasonal wetness and the slow permeability in the subsoil are the main limitations of this soil for community development.

The capability subclass is IIw.

8B—Buchanan cobbly fine sandy loam, 2 to 7 percent slopes. This soil is deep, gently sloping, and somewhat poorly drained. It is on broad, concave mountain foot slopes. Shallow intermittent drainageways are common in this soil. The areas of this soil are irregular in shape and range from about 5 to 500 acres.

Typically, the surface layer of this soil is yellowish brown cobbly fine sandy loam about 7 inches thick. The upper part of the subsoil is yellowish brown loam and mottled sandy clay loam 14 inches thick. The lower part of the subsoil is 21 inches thick. It is a brittle and compact layer of yellowish brown cobbly sandy loam. The substratum is yellowish brown cobbly sandy clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Cotaco, and Purdy soils that make up about 20 percent of this unit. The Laidig soils are well drained, the Cotaco soils are moderately well drained, and the Purdy soils are poorly drained. Also included are small areas of stony or very stony soils that make up about 5 percent of the unit.

The permeability of this Buchanan soil is moderate above the brittle, compact part of the subsoil and slow in the brittle part. The available water capacity of the soil is moderate. Surface runoff is medium. A seasonal high water table is perched on the lower part of the subsoil in winter and spring. Tilth of the soil is fair, but the soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone is restricted to a depth of about 21 inches by the lower part of the subsoil. The surface layer and subsoil in unlimed areas are commonly very strongly acid or strongly acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Some of the acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth. Droughtiness during the growing season and a moderate hazard of erosion are the major farm management concerns. The cobblestones and gravel in the soil cause damage to tillage equipment and interfere with planting. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to increase organic matter content.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer are practices that help to maintain pastures and control erosion. Grazing during periods of seasonal wetness often cuts and compacts the surface layer, increasing the erosion hazard.

This soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

The seasonal high water table and the slow permeability in the subsoil are the main limitations of the soil for community development.

The capability subclass is IIe.

8C—Buchanan cobbly fine sandy loam, 7 to 15 percent slopes. This soil is sloping, deep, and somewhat poorly drained. It is on broad, concave lower mountain foot slopes. Shallow intermittent drainageways are common in this soil. The areas of this soil are irregular in shape and range from 5 to several hundred acres.

Typically, the surface layer of this soil is yellowish brown cobbly fine sandy loam about 7 inches thick. The upper part of the subsoil is yellowish brown loam and mottled sandy clay loam 14 inches thick. The lower part of the subsoil is a brittle and compact layer of yellowish

brown cobbly sandy loam 21 inches thick. The substratum is yellowish brown cobbly sandy clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Berks, Sequoia, and Shelocta soils that make up about 20 percent of this unit. Also included are small areas of very stony soils and wet soils that make up about 5 percent of the unit.

The permeability of this Buchanan soil is moderate above the brittle, compact part of the subsoil and slow in the brittle part. The available water capacity of the soil is moderate. Surface runoff is slow. A seasonal high water table is perched on the lower part of the subsoil in winter and spring. Tilth of the soil is fair, but the soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone is restricted to a depth of about 21 inches by the lower part of the subsoil. The surface layer and subsoil in unlimed areas are commonly very strongly acid or strongly acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Some of the acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth. Droughtiness during the growing season and a moderate hazard of erosion are the major farm management concerns. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to increase organic matter content.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer are practices that help to maintain pastures and control erosion. Grazing during periods of seasonal wetness often cuts and compacts the surface layer, increasing the erosion hazard.

This soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

The seasonal high water table and the slow permeability in the subsoil are the main limitations of the soil for community development.

The capability subclass is IIIe.

9C—Buchanan very stony fine sandy loam, 7 to 15 percent slopes. This soil is deep, sloping, and somewhat poorly drained. It is on broad, concave lower mountain foot slopes. Shallow intermittent drainageways are common in this soil. Sandstone and quartzite stones cover about 3 to 15 percent of the surface of the soil. The areas of the soil are irregular in shape and range from 10 to several hundred acres.

Typically, the surface layer of this soil is yellowish brown fine sandy loam about 7 inches thick. The upper part of subsoil is yellowish brown loam and mottled sandy clay loam 14 inches thick. The lower part of the subsoil is a dense, compact layer of yellowish brown cobbly sandy loam 21 inches thick. The substratum is mottled, yellowish brown cobbly sandy clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Berks, Sequoia, and Shelocta soils that make up about 20 percent of this unit. Also included are small wet areas along drainageways and extremely stony soils that make up about 5 percent of the unit.

The permeability of this Buchanan soil is moderate above the brittle, compact part of the subsoil and slow in the brittle part. The available water capacity of the soil is moderate. Surface runoff is slow. A seasonal high water table is perched on the lower part of the subsoil in winter and spring. Tilth of the soil is fair, but the soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone is restricted to a depth of about 21 inches by the lower part of the subsoil. The surface layer and subsoil in unlimed areas are commonly very strongly acid or strongly acid.

The seasonal high water table, droughtiness in summer, a severe erosion hazard, and the stones on the surface make this soil generally unsuitable for cultivated crops and poorly suited to pasture. Maintaining a mixture of grasses and legumes, pasture rotation, and deferred grazing help to maintain pastures and control erosion.

This soil is well suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

Seasonal wetness and the slow permeability in the subsoil are the main limitations of this soil for community development.

The capability subclass is VIs.

10A—Buckton loam, 0 to 4 percent slopes. This soil is deep, nearly level to gently sloping, and well drained. It is on flood plains bordering the major streams and rivers. The areas of this soil commonly are long and narrow and range from 3 to 40 acres.

Typically, the surface layer is dark brown loam about 8 inches thick. The substratum extends to a depth of 60 inches or more. It is dark brown loam in the upper part and brown and grayish brown fine sandy loam in the lower part.

Included with this soil in mapping are small intermingled areas of Aquic Udifluvents and Wheeling and Millrock soils. Included areas make up about 10 to 15 percent of the unit.

The permeability of this Buckton soil is moderate. The available water capacity is moderate. Surface runoff is slow. Tilth is good, and the soil is high in natural fertility and moderate in content of organic matter. The root zone extends to a depth of about 50 inches or more. The surface layer and subsoil commonly are neutral to

moderately alkaline. This soil is subject to flooding during periods of high rainfall.

This soil is suited to cultivated crops and to pasture and hay crops, but only a few areas are used for cultivated crops because of the flooding hazard. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to maintain tilth and prevent scouring. Crop residue kept on or in the surface layer helps to hold the soil in place during flooding.

Establishing and maintaining a mixture of grasses and legumes, pasture rotation, deferred grazing, and the use of lime and fertilizer are the main pasture management practices.

This soil is well suited to trees, but only a very small acreage is wooded. Potential productivity is very high. The soil is managed mostly for hardwoods and pine.

The hazard of flooding is the main limitation of this soil for community development.

The capability subclass is IIw.

11B—Burketown fine sandy loam, 2 to 10 percent slopes. This soil is deep, gently sloping, and moderately well drained. It is on broad terraces along the major streams and rivers. The areas of this soil commonly are irregular in shape and range from about 5 to 125 acres.

Typically, the surface layer is brown fine sandy loam about 11 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 13 inches of the subsoil is yellowish brown fine sandy loam. The next 20 inches is a dense, compact layer of strong brown and light brownish gray fine sandy loam. The subsoil at a depth of more than 44 inches is yellowish red sandy clay loam.

Included with this soil in mapping are small intermingled areas of Monongahela, Buchanan, and Millrock soils that make up about 15 percent of the unit.

The permeability of this Burketown soil is moderately rapid in the upper layers, slow in the compact part of the subsoil, and moderate or moderately rapid in the lower part of the subsoil. Surface runoff is slow to medium. Tilth is good, but the soil is low in natural fertility and content of organic matter. The compact part of the subsoil restricts root growth to a depth of about 24 inches. A seasonal high water table is perched on that part of the subsoil in winter and spring. The surface layer and subsoil in unlimed areas are commonly very strongly acid to medium acid.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Alfalfa is commonly short lived because of seasonal wetness and restricted root growth, and the soil is droughty during the growing season. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve the available water capacity and tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing help to reduce erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer, increasing the hazard of erosion.

This soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The seasonal high water table and the slow permeability in the compact part of the substratum are the main limitations of this soil for community development.

The capability subclass is IIe.

12B—Carbo-Endcav-Rock outcrop complex, 2 to 7 percent slopes. This unit consists of gently sloping, moderately deep and deep, well drained soils. It is on the side slopes and tops of hills and ridges that are commonly marked by sinkholes. The areas of this unit are long and narrow and range from about 3 to 200 acres. The unit is about 35 percent Carbo soils, 30 percent Endcav soils, 25 percent areas of exposed bedrock 30 to 100 feet apart, and 10 percent other soils. The soils and exposed rock in this unit are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Carbo soils is dark brown silt loam about 10 inches thick. The subsoil is strong brown and dark yellowish brown, firm clay 22 inches thick. Limestone bedrock is at a depth of 32 inches.

The surface layer of the Endcav soils is dark yellowish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish brown clay about 50 inches thick. Limestone bedrock is at a depth of 57 inches.

Included with these soils in mapping are small intermingled areas of Chilhowie and Guernsey soils and Typic Fluvaquents.

Permeability is slow in these Carbo and Endcav soils. The available water capacity of both soils is low, and surface runoff is medium. Tilth is fair. Both soils are medium in natural fertility and low in organic matter content, and the subsoil of both has a high shrink-swell potential. The root zone extends to bedrock in both soils. The Carbo soils are slightly alkaline to mildly alkaline. The Endcav soils are strongly acid to neutral.

The areas of exposed rock and the sinkholes make these soils generally unsuitable for cultivated crops. The soils are moderately well suited to pasture, however, and much of the acreage is pastured. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing help to control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soils are managed for hardwoods and pine.

The areas of exposed rock, the permeability, and the shrink-swell potential limit these soils for community development.

The capability subclass is VIs.

12C—Carbo-Endcav-Rock outcrop complex, 7 to 15 percent slopes. This unit consists of sloping, moderately deep and deep, well drained soils. It is on the side slopes and tops of hills and ridges that are commonly marked by sinkholes. The areas of this unit are long and narrow and range from about 3 to 200 acres. The unit is about 30 percent Carbo soils, 30 percent Endcav soils, 25 percent areas of exposed bedrock 30 to 100 feet apart, and 15 percent other soils. The soils and exposed rock in this unit are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Carbo soils is dark brown silt loam about 10 inches thick. The subsoil is strong brown and dark yellowish brown, firm clay 22 inches thick. Limestone bedrock is at a depth of 32 inches.

The surface layer of the Endcav soils is dark yellowish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish brown clay about 50 inches thick. Limestone bedrock is at a depth of 57 inches.

Included with these soils in mapping are small intermingled areas of Chilhowie and Guernsey soils and Typic Fluvaquents.

Permeability is slow in these Carbo and Endcav soils. The available water capacity of both soils is low, and surface runoff is medium to rapid. Tilth is fair. Both soils are medium in natural fertility and low in organic matter content, and the subsoil of each has a high shrink-swell potential. The root zone extends to bedrock in both soils. The Carbo soils are slightly alkaline to mildly alkaline. The Endcav soils are strongly acid to neutral.

The areas of exposed rock and the sinkholes make these soils generally unsuitable for cultivated crops. The soils are moderately well suited to pasture, however, and much of the acreage is pastured. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing help to control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soils are managed for hardwoods and pine.

The areas of exposed rock, the permeability, and the shrink-swell potential limit these soils for community development.

The capability subclass is VIs.

13A—Chavies fine sandy loam, 0 to 4 percent slopes. This soil is gently sloping and well drained. It is on broad, low terraces along the larger streams in the county (fig. 2). The areas of this soil commonly are long and narrow and range from about 10 to 100 acres.

Typically, the surface layer is dark brown fine sandy loam about 11 inches thick. The subsoil is brown fine sandy loam about 31 inches thick. The substratum is brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Allegheny, Craigsville, and Millrock soils that make up about 25 percent of the unit. The Allegheny soils are commonly on high areas near the uplands, and the Craigsville and Millrock soils are along abandoned drainageways and channels. Also included are small spots of very gravelly and cobbly soils in abandoned channels that make up about 5 percent of the unit.

Permeability of this Chavies soil is moderately rapid. The available water capacity is moderate. Surface runoff is medium. Tilth is good, and the soil is moderate in natural fertility and low in organic matter content. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas are commonly medium acid to strongly acid. The soil is subject to rare flooding for very brief periods.

This soil is suited to cultivated crops and to pasture and hay. Most areas are farmed. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help increase organic matter content and maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer are practices that help to maintain pasture and control erosion.

The soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed mostly for hardwoods.

Flooding is the main limitation of this soil for community development.

The capability class is I.

14B2—Chilhowie silty clay, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on ridgetops and knolls. The areas of this soil are long and winding and range from about 5 to 75 acres. Many areas have shallow drainageways about 100 to 200 feet apart.

Typically, the surface layer of this soil is dark brown silty clay about 5 inches thick. The subsoil is strong brown clay about 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 25 inches.

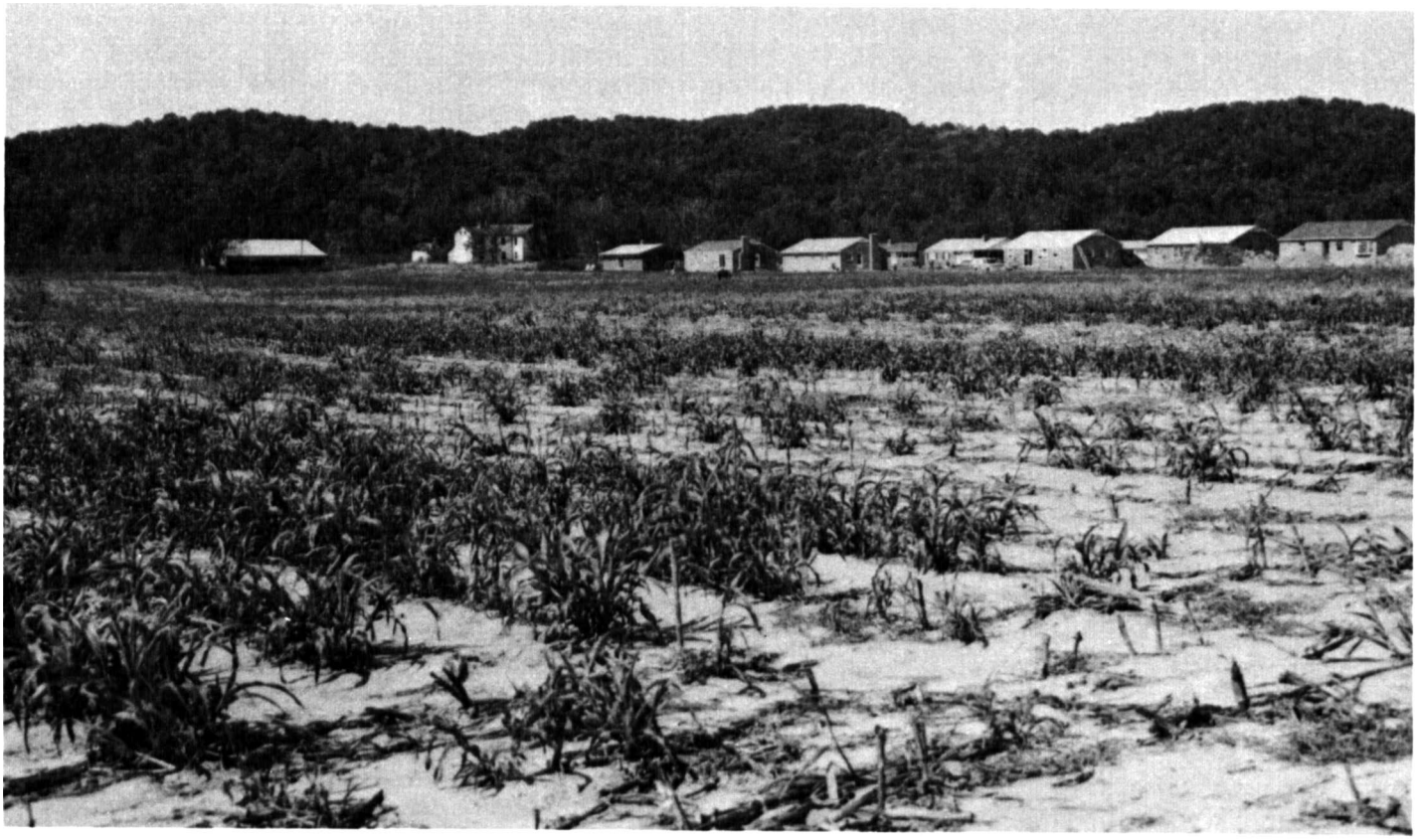


Figure 2.—This area of Chavies fine sandy loam, 0 to 4 percent slopes, is used for farmland and community development.

Included with this soil in mapping are small intermingled areas of Edom soils that make up about 10 percent of this unit. Also included are small areas of soils that are less than 20 inches deep to bedrock, spots of wet soils, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 10 percent of the unit.

The permeability of this Chilhowie soil is slow. The available water capacity is low. Surface runoff is medium. Tilth is fair, but the plow layer is hard and cloddy when the soil is dry and sticky when the soil is wet. The soil is high in natural fertility but low in organic matter content. The subsoil has a high shrink-swell potential. The root zone extends to a depth of about 25 inches. The surface layer and subsoil commonly are slightly acid tc mildly alkaline, and the substratum commonly is moderately alkaline. Bedrock is at a depth of 2 to 3-1/2 feet.

This soil is moderately well suited to small grains and to pasture and hay (fig. 3). Much of the acreage is used for farming. Droughtiness during the growing season and a severe hazard of erosion limit the soil for cultivation. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer help to maintain pastures and control erosion.

This soil is moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate. The soil is managed mostly for pine.

The depth to bedrock, the slow permeability, and the high shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIIe.

14C2—Chilhowie silty clay, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on ridgetops, knolls, and side slopes. The areas of this soil are long and narrow and range from about 5 to 100 acres. Many areas have shallow drainageways about 100 to 200 feet apart.

Typically, the surface layer of this soil is dark brown silty clay about 5 inches thick. The subsoil is strong brown clay about 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 25 inches.

Included with this soil in mapping are small intermingled areas of Edom soils that make up about 10 percent of this unit. Also included are small areas of soils that are less than 20 inches deep to bedrock, spots of wet soils, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 10 percent of the unit.

The permeability of this Chilhowie soil is slow. The available water capacity is low. Surface runoff is medium to rapid. Tilth is fair, but the plow layer is hard and cloddy when the soil is dry and sticky when the soil is wet. The soil is high in natural fertility but low in organic matter content. The subsoil has a high shrink-swell potential. The root zone extends to a depth of about 25 inches. The surface layer and subsoil commonly are slightly acid to mildly alkaline, and the substratum commonly is moderately alkaline. Bedrock is at a depth of 2 to 3-1/2 feet.

This soil is moderately well suited to small grains and to pasture and hay. Much of the acreage is used for farming. Droughtiness during the growing season and a severe hazard of erosion limit the soil for cultivation. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of

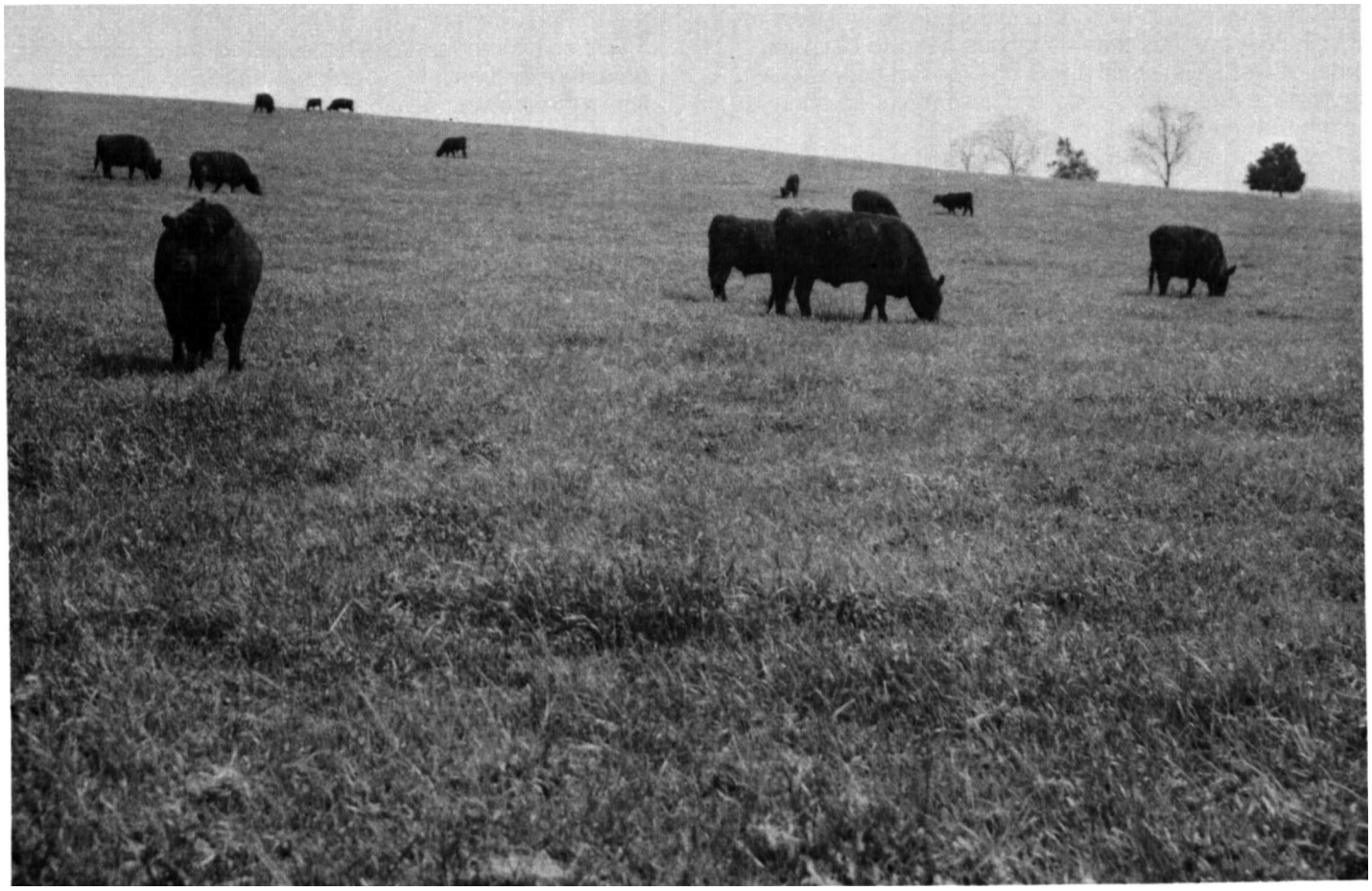


Figure 3.—Pasture on an area of Chilhowie silty clay, 2 to 7 percent slopes, eroded.

lime and fertilizer help to maintain pastures and control erosion.

This soil is moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate. The soil is managed mostly for pine.

The depth to bedrock, the slow permeability, and the high shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IVe.

14D2—Chilhowie silty clay, 15 to 25 percent slopes, eroded. This soil is moderately steep and well drained. It is on side slopes of hills and ridges. The areas of this soil are long and winding and range from about 5 to 150 acres. Most areas have shallow drainageways about 100 to 200 feet apart.

Typically, the surface layer of this soil is dark brown silty clay about 3 inches thick. The subsoil is strong brown clay 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 23 inches.

Included with this soil in mapping are small intermingled areas of Edom soils that make up about 10 to 15 percent of this unit. Also included are small areas of soils that are less than 20 inches deep to bedrock, spots of wet soils, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 10 percent of the unit.

The permeability of this Chilhowie soil is slow, and the available water capacity is very low. Surface runoff is very rapid. Tilth is fair. The soil is high in natural fertility but low in organic matter content. The subsoil has a high shrink-swell potential. The root zone extends to a depth of about 23 inches. The surface layer and subsoil commonly are slightly acid to mildly alkaline, and the substratum commonly is moderately alkaline. Bedrock is at a depth of 2 to 3-1/2 feet.

Droughtiness during the growing season and a very severe hazard of erosion make this soil generally unsuitable for cultivated crops. The soil is moderately well suited to pasture and hay crops. Most areas are farmed. Establishing and maintaining a mixture of grasses and legumes and prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion.

Slope, the depth to bedrock, the slow permeability, and the shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is VIe.

15B2—Chilhowie silty clay, rocky, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on ridgetops and knolls. The areas of this soil are long and winding and range from about 5 to 100 acres. Areas of exposed bedrock 100 to 300 feet apart are on the surface. Many areas of the soil have shallow drainageways 100 to 200 feet apart.

Typically, the surface layer of this soil is dark brown silty clay about 5 inches thick. The subsoil is strong brown clay about 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 25 inches.

Included with this soil in mapping are small intermingled areas of Carbo and Edom soils that make up about 10 to 15 percent of this unit. Also included are small areas of soils that are less than 20 inches deep to bedrock, spots of wet soils, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability of this Chilhowie soil is slow. The available water capacity is very low. Surface runoff is medium. Tilth is fair, but the plow layer is hard and cloddy when the soil is dry and sticky when the soil is wet. The soil is high in natural fertility but low in organic matter content. The subsoil has a high shrink-swell potential. The root zone extends to a depth of about 25 inches. The surface layer and subsoil commonly are slightly acid to mildly alkaline, and the substratum commonly is moderately alkaline. Bedrock is at a depth of 2 to 3-1/2 feet.

This soil is moderately well suited to small grains and to pasture and hay. Most areas are farmed. Droughtiness during the growing season, the areas of exposed rock, and a severe hazard of erosion make the soil poorly suited to row crops. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices in cultivated areas that help increase organic matter content, improve tilth, and control erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer help to maintain pastures and control erosion.

This soil is moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate. The soil is managed mostly for pine.

The depth to bedrock, the slow permeability, and the high shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIIe.

15C2—Chilhowie silty clay, rocky, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on narrow ridgetops, knolls, and side slopes. The areas are long and narrow and range from about 5 to 60 acres. Areas of exposed bedrock 100 to 300 feet apart are on the surface. Most areas of the soil have shallow drainageways 100 to 200 feet apart.

Typically, the surface layer of this soil is dark brown silty clay about 5 inches thick. The subsoil is strong

brown clay about 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 25 inches.

Included with this soil in mapping are small intermingled areas of Carbo and Edom soils that make up about 10 to 15 percent of this unit. Also included are small areas of soils that are less than 20 inches deep to bedrock, spots of wet soils, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability of this Chilhowie soil is slow. The available water capacity is very low. Surface runoff is medium to rapid. Tilth is fair, but the plow layer is hard and cloddy when the soil is dry and sticky when the soil is wet. The soil is high in natural fertility but low in organic matter content. The subsoil has a high shrink-swell potential. The root zone extends to a depth of about 25 inches. The surface layer and subsoil commonly are slightly acid to mildly alkaline, and the substratum commonly is moderately alkaline. Bedrock is at a depth of 2 to 3-1/2 feet.

This soil is moderately well suited to small grains and to pasture and hay. Most areas are farmed. Droughtiness during the growing season, the areas of exposed rock, and a severe hazard of erosion make the soil poorly suited to row crops. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices in cultivated areas that help increase organic matter content, improve tilth, and control erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer help to maintain pastures and control erosion.

This soil is moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate. The soil is managed mostly for pine.

The depth to bedrock, the slow permeability, and the high shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IVe.

15D2—Chilhowie silty clay, rocky, 15 to 25 percent slopes, eroded. This soil is moderately steep and well drained. It is on side slopes of hills and ridges. The areas of this soil are long and winding and range from about 5 to 50 acres. Areas of exposed bedrock 100 to 300 feet apart are on the surface. Most areas of this soil have shallow drainageways 100 to 200 feet apart.

Typically, the surface layer of this soil is dark brown silty clay about 4 inches thick. The subsoil is strong brown clay about 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 24 inches.

Included with this soil in mapping are small intermingled areas of Carbo and Edom soils that make up about 10 to 15 percent of this unit. Also included are small areas of soils that are less than 20 inches deep to bedrock, spots of wet soils, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability of this Chilhowie soil is slow, and the available water capacity is very low. Surface runoff is very rapid. Tilth is fair. The soil is high in natural fertility but low in organic matter content. The subsoil has a high shrink-swell potential. The root zone extends to a depth of about 23 inches. The surface layer and subsoil commonly are slightly acid to mildly alkaline, and the substratum commonly is moderately alkaline. Bedrock is at a depth of 2 to 3-1/2 feet.

Droughtiness during the growing season, the areas of exposed rock, and a very severe hazard of erosion make this soil generally unsuitable for cultivated crops. The soil is moderately well suited to and mainly used for pasture and hay. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing help to maintain pastures and control erosion.

The soil is moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate. The soil is managed mostly for pine.

Slope, the depth to bedrock, and the slow permeability of the soil are the main limitations for community development.

The capability subclass is VIe.

16E3—Chilhowie clay, rocky, 25 to 45 percent slopes, severely eroded. This soil is steep and well drained. It is on side slopes and the points of hills and ridges. The areas of this soil are long and winding and range from about 5 to 100 acres. Areas of exposed bedrock 100 to 300 feet apart cover the surface. Most areas of this soil have shallow drainageways 100 to 200 feet apart.

Typically, the surface layer of this soil is dark brown clay about 3 inches thick. The subsoil is strong brown clay about 8 inches thick. The substratum is strong brown very channery clay 10 inches thick. Interbedded calcareous shale and limestone are at a depth of 21 inches.

Included with this soil in mapping are small intermingled areas of Edom soils that make up about 10 percent of this unit. Also included are areas of soils that are less than 20 inches deep to bedrock, narrow spots of wet soils along drainageways, and small areas of extremely shaly and flaggy soils. These make up about 10 percent of the unit.

The permeability of this Chilhowie soil is slow. The available water capacity is very low. Surface runoff is rapid. The soil is high in natural fertility and low in organic matter content. The subsoil has a high shrink-

swell potential. The root zone extends to a depth of about 21 inches. The surface layer and subsoil commonly are slightly acid to mildly alkaline, and the substratum commonly is moderately alkaline. Bedrock is at a depth of 2 to 3-1/2 feet.

A very severe erosion hazard, droughtiness during the growing season, and the areas of exposed rock make this soil generally unsuitable for cultivated crops and poorly suited to tame pasture. The soil, however, is well suited to bluegrass. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Using proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soil is moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate. The soil is managed mostly for pine.

Slope, the depth to bedrock, and the slow permeability of the soil are the main limitations for community development.

The capability subclass is VIIe.

17B2—Chilhowie-Edom silty clay loams, 2 to 7 percent slopes, eroded. This unit consists of gently sloping, well drained soils on knolls and narrow ridgetops. The areas of these soils are long and winding and range from about 5 to 50 acres. Many of the larger areas have shallow drainageways 100 to 300 feet apart. The unit is about 40 percent Chilhowie soils, 40 percent Edom soils, and 20 percent other soils. The Chilhowie and Edom soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Chilhowie soils is dark brown silty clay loam about 5 inches thick. The subsoil is strong brown clay 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 25 inches.

The surface layer of the Edom soils is yellowish brown silty clay loam about 6 inches thick. The subsoil is strong brown clay 28 inches thick. The substratum is multicolored shaly silty clay loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of nearly level Timberville Variant soils along upland drainageways. Also included are small wet areas along drainageways, spots of exposed bedrock, spots of severely eroded soils, and small areas of soils that are less than 20 inches deep to bedrock.

The permeability of the Chilhowie soils is slow, and available water capacity is very low. The subsoil of the Chilhowie soils has a high shrink-swell potential. The root zone extends to bedrock at a depth of 2 to 3-1/2 feet. The permeability of the Edom soils is moderately slow, and available water capacity is moderate. The subsoil of the Edom soils has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of 3-1/2 to 5 feet.

Surface runoff is medium on the Chilhowie and Edom soils. Tilth is fair in both soils, but the plow layer is hard and cloddy when dry and sticky when wet. The soils have medium to high natural fertility and low organic matter content. The surface layer and subsoil of these soils commonly are strongly acid to mildly alkaline, and the substratum is medium acid to moderately alakline.

These soils are moderately well suited to cultivated crops and to pasture and hay. Most areas are farmed. The main limitations are droughtiness in the Chilhowie soils during the growing season and a severe hazard of erosion in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept in or on the surface layer helps to increase organic matter content.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pasture and control erosion.

The soils are moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate to high.

The depth to bedrock in the Chilhowie soils and the permeability of the soils are the main limitations for community development.

The capability subclass is IIe.

17C2—Chilhowie-Edom silty clay loams, 7 to 15 percent slopes, eroded. This unit consists of sloping, well drained soils on knolls, narrow ridgetops, and side slopes. The areas of these soils are long and winding and range from 5 to 75 acres. Many of the larger areas have shallow drainageways 100 to 300 feet apart. The unit is about 40 percent Chilhowie soils, 40 percent Edom soils, and 20 percent other soils. The Chilhowie and Edom soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Chilhowie soils is dark brown silty clay loam about 5 inches thick. The subsoil is strong brown clay 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 25 inches.

The surface layer of the Edom soils is yellowish brown silty clay loam about 6 inches thick. The subsoil is strong brown clay 28 inches thick. The substratum is multicolored shaly silty clay loam to a depth of 60 inches or more.

Included with these soils in mapping are small intermingled areas of nearly level Timberville Variant soils along upland drainageways. Also included are small

wet areas along drainageways, spots of exposed bedrock, spots of severely eroded soils, and small areas of soils that are less than 20 inches deep to bedrock.

The permeability of the Chilhowie soils is slow, and available water capacity is very low. The subsoil of the Chilhowie soils has a high shrink-swell potential. The root zone extends to bedrock at a depth of 2 to 3-1/2 feet. The permeability of the Edom soils is moderately slow, and available water capacity is moderate. The subsoil of the Edom soils has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of 3-1/2 to 5 feet.

Surface runoff is medium to rapid on the Chilhowie and Edom soils. Tilth is fair in both soils, but the plow layer is hard and cloddy when dry and sticky when wet. The soils have medium to high natural fertility and low organic matter content. The surface layer and subsoil of these soils commonly are strongly acid to mildly alkaline, and the substratum is medium acid to moderately alakline.

Droughtiness in the Chilhowie soils during the growing season and a severe hazard of erosion make these soils poorly suited to cultivated crops. The soils are suited to close-growing crops and to pasture and hay crops. Most areas are farmed. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to increase organic matter content.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pasture and control erosion.

The soils are moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate to high. The soils are managed mostly for pine.

The depth to bedrock in the Chilhowie soils and the permeability of the soils are the main limitations for community development.

The capability subclass is IIIe.

17D2—Chilhowie-Edom silty clay loams, 15 to 25 percent slopes, eroded. This unit consists of moderately steep, well drained soils on side slopes of hills and ridges. The areas of this unit are long and winding and range from 5 to 50 acres. Many of the larger areas have shallow drainageways 100 to 300 feet apart. The unit is about 50 percent Chilhowie soils, 30 percent Edom soils, and 20 percent other soils. The Chilhowie and Edom soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Chilhowie soils is dark brown silty clay loam about 5 inches thick. The subsoil is strong brown clay 8 inches thick. The substratum is strong brown very channery clay 12 inches thick. Interbedded calcareous shale and limestone are at a depth of 25 inches.

The surface layer of the Edom soils is yellowish brown silty clay loam about 6 inches thick. The subsoil is strong brown clay 28 inches thick. The substratum is multicolored shaly silty clay loam to a depth of 60 inches or more.

Included with these soils in mapping are small intermingled areas of nearly level Timberville Variant soils along upland drainageways. Also included are small wet areas along drainageways, spots of exposed bedrock, spots of severely eroded soils, and small areas of soils that are less than 20 inches deep to bedrock.

The permeability of the Chilhowie soils is slow, and available water capacity is very low. The subsoil of the Chilhowie soils has a high shrink-swell potential. The root zone extends to bedrock at a depth of 2 to 3-1/2 feet. The permeability of the Edom soils is moderately slow, and available water capacity is moderate. The subsoil of the Edom soils has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of 3-1/2 to 5 feet.

Surface runoff is rapid on the Chilhowie and Edom soils. Tilth is fair in both soils, but the plow layer is hard and cloddy when dry and sticky when wet. The soils have medium to high natural fertility and low organic matter content. The surface layer and subsoil of these soils commonly are strongly acid to mildly alkaline, and the substratum is medium acid to moderately alkaline.

Droughtiness in the Chilhowie soils during the growing season and a very severe erosion hazard make these soils poorly suited to cultivated crops. The soils are moderately well suited to and mainly used for pasture and hay. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing help to maintain pastures and decrease erosion.

The soils are moderately well suited to trees, but only a small acreage is wooded. Potential productivity is moderate to high. The soils are managed mostly for pine.

Slope and the depth to bedrock in the Chilhowie soils are the main limitations for community development.

The capability subclass is VIe.

18B—Cotaco fine sandy loam, 0 to 7 percent slopes. This soil is gently sloping and moderately well drained. It is on broad terraces east of the South Fork of the Shenandoah River. Areas of this soil commonly are irregular in shape and range from about 3 to 300 acres.

Typically, the surface layer is pale brown fine sandy loam about 7 inches thick. The subsoil is 38 inches thick. It is mostly yellowish brown light clay loam that is mottled in the upper part. The substratum is variegated cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Buchanan, Purdy, and Allegheny soils that make up about 20 percent of this unit. The Laidig soils are near the uplands, the Buchanan soils are along drainageways, the Purdy soils are in nearly level or depressional areas, and the Allegheny soils are near the river. Also included are spots of soils that have a loam surface layer or a cobbly surface layer. These make up about 5 percent of the unit.

The permeability of this Cotaco soil is moderate. The available water capacity is moderate. Surface runoff is medium. Tilth is good, but the soil is low in natural fertility and organic matter content. The root zone extends to a depth of 60 inches, but root growth is restricted by a seasonal high water table at a depth of about 1-1/2 to 2-1/2 feet in winter and spring. The surface layer and subsoil in unlimed areas commonly are strongly acid to very strongly acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Alfalfa is commonly short lived because of seasonal wetness and restricted root growth, and the soil is droughty during the growing season. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The seasonal high water table in winter and spring and a frost-action potential are the main limitations of the soil for community development.

The capabiltiy subclass is IIw.

19B—Cotaco cobbly fine sandy loam, 0 to 7 percent slopes. This soil is gently sloping and moderately well drained. It is on broad terraces east of the South Fork of the Shenandoah River. The areas of this soil commonly are irregular in shape and range from about 3 to 300 acres.

Typically, the surface layer is pale brown cobbly fine sandy loam about 7 inches thick. The subsoil is 38 inches thick. It is mostly yellowish brown light clay loam that is mottled in the upper part. The substratum is variegated cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Buchanan, Purdy, and Allegheny soils that make up about 20 percent of this unit. The Laidig and Buchanan soils are generally near the uplands, the Purdy soils are in nearly level or depressional areas, and the Allegheny soils are near the river. Also included are spots of soils with a surface layer of loam that make up about 5 percent of the unit.

The permeability of this Cotaco soil is moderate. The available water capacity is moderate. Surface runoff is medium. Tilth is good, but the soil is low in natural fertility and organic matter content. The root zone extends to a depth of 60 inches, but root growth is restricted by a seasonal high water table at a depth of about 1-1/2 to 2-1/2 feet in winter and spring. The surface layer and subsoil in unlimed areas are commonly strongly acid to very strongly acid.

This soil is suited to cultivated crops and to pasture and hay. Some of the acreage is farmed. Alfalfa is commonly short lived because of seasonal wetness and restricted root growth. The main limitations of the soil for crops are droughtiness during the growing season and cobbles and pebbles in the soil, which damage tillage equipment and interfere with planting. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The seasonal high water table in winter and spring and a high frost-action potential are the main limitations of the soil for community development.

The capability subclass is IIw.

20B—Cotaco Variant cobbly loam, 1 to 7 percent slopes. This soil is gently sloping and moderately well drained. It mainly is on broad, slightly concave foot slopes. The areas of this soil commonly are irregular in shape and range from about 3 to 300 acres.

Typically, the surface layer is yellowish brown cobbly loam about 5 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 5 and 36 inches, it is yellowish brown silt loam, loam, and clay loam and is mottled in the lower part. It is variegated clay at a depth of more than 36 inches.

Included with this soil in mapping are small intermingled areas of Laidig, Unison, Purdy, and Allegheny soils that make up about 25 percent of this unit.

The permeability of this Cotaco Variant soil is moderate to moderately slow. The available water capacity is moderate. Surface runoff is medium. Tilth is good, but the soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of 60 inches, but root growth is restricted by a seasonal high water table at a depth of about 2 to 3 feet in winter and spring. The surface layer and subsoil in unlimed areas are strongly acid or very strongly acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. A small acreage is farmed. Alfalfa is commonly short lived because of seasonal wetness. The main limitations for farming are droughtiness during the growing season and cobblestones in the soil, which damage tillage equipment and interfere with planting. The hazard of erosion in cultivated areas is moderate, especially on the longer slopes. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

The seasonal high water table in winter and spring is the main limitation for community development.

The capability subclass is IIw.

21B—Craigsville cobbly fine sandy loam, 0 to 4 percent slopes. This soil is nearly level to gently sloping and well drained. It is on low terraces adjacent to flood plains of the major streams and rivers. The areas of this soil are long and narrow and range from about 10 to 150 acres.

Typically, the surface layer is dark brown cobbly fine sandy loam about 8 inches thick. The subsoil is reddish brown cobbly loam 14 inches thick. The substratum is brown very cobbly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Typic Udorthents and Chavies and Allegheny soils, all of which make up about 15 percent of this unit. Also included are a few small wet spots and extremely cobbly or gravelly areas that make up about 10 percent of the unit.

The permeability of this Craigsville soil is moderately rapid, and the available water capacity is low. Surface runoff is slow. Tilth is good. The soil is medium in natural fertility and low in content of organic matter. The root zone extends to a depth of 60 inches. The surface layer and subsoil in unlimed areas are commonly strongly acid. This soil is subject to flooding for brief periods during high rainfall.

This soil is moderately suited to cultivated crops but is better suited to small grains and pasture and hay. Most areas are farmed. Flash flooding is the major hazard. The main limitations for cultivation are cobblestones and pebbles in the soil, which damage tillage equipment and interfere with planting, and droughtiness during the growing season. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for pine and hardwoods (fig. 4).

Flooding is the main limitation of this soil for community development.

The capability subclass is IIIs.

Figure 4.—White pine on an area of Craigsville cobbly fine sandy loam, 0 to 4 percent slopes.

22F—Drall extremely stony sandy loam, 40 to 70 percent slopes. This soil is very steep and excessively drained. It is on upper mountain side slopes and mountaintops. The areas of this soil generally are long and winding and range from about 40 to 2,000 acres. Most are remote and generally inaccessible. Sandstone and quartzite stones cover about 15 to 40 percent of the surface.

Typically, the surface layer is gray gravelly sandy loam about 6 inches thick. The substratum is yellowish brown very stony sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Berks, Weikert, Dekalb, Lehew, and Calvin soils that make up about 10 percent of this unit. Stony rubble and large areas of exposed bedrock make up about 25 percent of the unit.

Permeability is rapid in this Drall soil, and the available water capacity is very low. Surface runoff is slow. The soil is low in natural fertility and organic matter content. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil commonly are strongly acid or very strongly acid.

Slope, the stones on the surface, and location make this soil generally unsuitable for most uses other than woodland. Nearly all of the acreage is wooded, and potential productivity is moderate. The soil is managed for hardwoods and pine.

The capability subclass is VIIs.

23B2—Edom silty clay loam, 2 to 7 percent slopes, eroded. This soil is well drained and gently sloping. It is on knolls and ridges. The areas of this soil are irregular in shape and range from 5 to 50 acres. Many of the larger areas have small drainageways, and some have a few areas of exposed bedrock.

Typically, the surface layer is yellowish brown silty clay loam about 6 inches thick. The subsoil is strong brown clay 28 inches thick. The substratum is variegated yellowish brown, strong brown, and yellowish red shaly silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Endcav and Chilhowie soils. Also included are spots of severely eroded soils and small areas of wet soils along the small drainageways. Included areas make up about 10 to 20 percent of the unit.

The permeability of this Edom soil is moderately slow. The available water capacity is moderate. Surface runoff is medium. Tilth is good, but the soil is hard when dry and sticky when wet. The soil is medium in natural fertility and low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of 60 inches. The soil is strongly acid to mildly alkaline in the upper part and medium acid to neutral in the lower part.

This soil is suited to cultivated crops and to pasture and hay. Most areas are farmed. A moderate hazard of erosion is the main management concern. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed mostly for white pine.

The permeability of the soil and the shrink-swell potential are the main limitations for community development.

The capability subclass is IIe.

23C2—Edom silty clay loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on rolling uplands dissected by drainageways. The areas of this soil are irregular in shape and range from 5 to 50 acres. Some areas have exposed bedrock on the surface.

Typically, the surface layer is yellowish brown silty clay loam about 6 inches thick. The subsoil is strong brown clay 28 inches thick. The substratum is variegated yellowish brown, strong brown, and yellowish red shaly silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Endcav and Chilhowie soils. Also included are spots of severely eroded soils and small areas of wet soils along the small drainageways. Included areas make up about 10 to 20 percent of the unit.

The permeability of this Edom soil is moderately slow. The available water capacity is moderate. Surface runoff is medium to rapid. Tilth is good, but the soil is hard when dry and sticky when wet. The soil is medium in natural fertility and low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of 60 inches. The soil is strongly acid to mildly alkaline in the upper part and medium acid to neutral in the lower part.

This soil is suited to cultivated crops and to pasture and hay. Most areas are farmed. A severe hazard of erosion is the main management concern. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed mostly for white pine.

The permeability of the soil and the shrink-swell potential are the main limitations for community development.

The capability subclass is IIIe.

23D2—Edom silty clay loam, 15 to 25 percent slopes, eroded. This soil is moderately steep and well drained. It is on side slopes of hills and ridges. The areas of this soil are irregular in shape and range from 3 to 40 acres. Most of the larger areas are dissected by numerous drainageways. A few areas have exposed bedrock on the surface.

Typically, the surface layer is a yellowish brown silty clay loam about 5 inches thick. The subsoil is strong brown clay 29 inches thick. The substratum is variegated yellowish brown, strong brown, and yellowish red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Chilhowie soils. Also included are long narrow areas of wet soils adjacent to the drainageways, spots of wet soils at the heads of drainageways, and small areas of severely eroded soils. Included areas make up about 10 to 20 percent of the unit.

The permeability of this Edom soil is moderately slow. The available water capacity is moderate. Surface runoff is rapid. Tilth is good, but the soil is hard when dry and sticky when wet. The soil is medium in natural fertility and low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of 60 inches. The soil is strongly acid to mildly alkaline in the upper part and medium acid to neutral in the lower part.

Slope and a severe erosion hazard make this soil poorly suited to row crops. Minimum tillage, stripcropping, and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer also helps to control erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed mostly for white pine.

Slope, permeability, and the shrink-swell potential are the main limitations for the soil for community development.

The capability subclass is IVe.

24B2—Endcav silt loam, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on ridgetops, hills, and side slopes. The areas of this soil are rectangular and range from 3 to 40 acres. Many have shallow drainageways about 100 to 300 feet apart.

Typically, the surface layer is dark yellowish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish brown clay 50 inches thick. Limestone bedrock is at a depth of 57 inches.

Included with this soil in mapping are small intermingled areas of Carbo, Chilhowie, Edom, and Frederick soils that make up about 10 to 15 percent of this unit. Also included are spots of wet soils, spots of severely eroded soils, small areas of exposed bedrock, and sinkholes. These make up about 5 percent of the unit.

The permeability of this Endcav soil is slow, and the available water capacity is moderate. Runoff is medium. This soil can be easily tilled, but the plow layer is hard and cloddy when dry and sticky when wet. The soil is high in natural fertility and low in content of organic matter. The subsoil has a high shrink-swell potential. The root zone extends to bedrock at a depth of more than 40 inches. This Endcav soil is strongly acid to neutral throughout.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most areas are farmed. A moderate hazard of erosion is the main management concern. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soil is managed mostly for pine and hardwoods.

The permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIe.

24C2—Endcav silt loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on ridgetops, hills, and side slopes. The areas of this soil

are rectangular and range from 3 to 40 acres. Many have shallow drainageways about 100 to 300 feet apart.

Typically, the surface layer is dark yellowish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish brown clay 50 inches thick. Limestone bedrock is at a depth of 57 inches.

Included with this soil in mapping are small intermingled areas of Carbo, Chilhowie, Edom, and Frederick soils that make up about 10 to 15 percent of this unit. Also included are spots of wet soils, spots of severely eroded soils, small areas of exposed bedrock, and sinkholes. These make up about 5 percent of the unit.

The permeability of this Endcav soil is slow, and the available water capacity is moderate. Runoff is medium. This soil can be easily tilled, but the plow layer is hard and cloddy when dry and sticky when wet. The soil is high in natural fertility and low in content of organic matter. The subsoil has a high shrink-swell potential. The root zone extends to bedrock at a depth of more than 40 inches. This Endcav soil is strongly acid to neutral throughout.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most areas are farmed. A severe hazard of erosion is the main management concern. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture managment concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soil is managed mostly for pine and hardwoods.

The permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIIe.

25B2—Endcav silt loam, rocky, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on ridgetops, hills, and side slopes. Areas of exposed bedrock 100 to 300 feet apart are on the surface, and many areas of the soil have shallow drainageways about 100 to 300 feet apart. The areas of this soil are rectangular and range from 5 to 70 acres.

Typically, the surface layer is dark yellowish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish brown clay 50 inches thick. Limestone bedrock is at a depth of 57 inches.

Included with this soil in mapping are small intermingled areas of Carbo, Chilhowie, Edom, and Frederick soils that make up about 10 to 15 percent of the unit. Also included are spots of wet soils, spots of severely eroded soils, small areas of very rocky soils, and sinkholes. These make up about 5 percent of the unit.

The permeability of this Endcav soil is slow, and the available water capacity is moderate. Runoff is medium. This soil can be easily tilled, but the plow layer is hard and cloddy when dry and sticky when wet. The soil is high in natural fertility and low in content of organic matter. The subsoil has a high shrink-swell potential. The root zone extends to bedrock at a depth of more than 40 inches. This Endcav soil is strongly acid to neutral throughout.

This soil is moderately well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. The main management concerns are a moderate erosion hazard and the areas of exposed rock, which interfere with tillage. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer also helps to control runoff and erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soil is managed mostly for pine and hardwoods.

The permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIe.

25C2—Endcav silt loam, rocky, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on ridgetops, hills, and side slopes. The areas of this soil are rectangular and range from 5 to 70 acres. Areas of exposed bedrock 100 to 300 feet apart are on the surface, and many areas of the soil have shallow drainageways about 100 to 300 feet apart.

Typically, the surface layer is dark yellowish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish brown clay 50 inches thick. Limestone bedrock is at a depth of 57 inches.

Included with this soil in mapping are small intermingled areas of Carbo, Chilhowie, Edom, and Frederick soils that make up about 10 to 15 percent of this unit. Also included are spots of wet soils, spots of severely eroded soils, small areas of very rocky soils, and sinkholes. These make up about 5 percent of the unit.

The permeability of this Endcav soil is slow, and the available water capacity is moderate. Runoff is rapid. This soil can be easily tilled, but the plow layer is hard and cloddy when dry and sticky when wet. The soil is

high in natural fertility and low in content of organic matter. The subsoil has a high shrink-swell potential. The root zone extends to bedrock at a depth of more than 40 inches. This Endcav soil is strongly acid to neutral throughout.

This soil is moderately well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. The main management concerns are a severe erosion hazard and the areas of exposed rock, which interfere with tillage. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer also helps to reduce erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soil is managed mostly for pine and hardwoods.

The permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIIe.

26C2—Fauquier stony silt loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on the lower foot slopes of the Blue Ridge Mountains. The areas of this soil are long and narrow and range from about 20 to 100 acres. Many areas of the soil have shallow drainageways about 100 to 400 feet apart. Stones cover less than 1 percent of the surface of the soil.

Typically, the surface layer of this soil is reddish brown silt loam about 7 inches thick. The subsoil is yellowish red and red clay 28 inches thick. The substratum is brownish yellow silt loam to a depth of 40 inches or more.

Included with this soil in mapping are small intermingled areas of Sylco, Hawksbill, and Myersville soils that make up about 10 to 15 percent of this unit. The Sylco and Myersville soils commonly have slopes of more than 15 percent. The Hawksbill soils are along drainageways. Also included are spots of very stony soils and extremely stony soils that make up about 5 percent of the unit.

The permeability of this soil is moderate, and the available water capacity is moderate. Surface runoff is medium to rapid. Tilth is fair, and the soil is medium in natural fertility and content of organic matter. The subsoil has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of 40 inches or more. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Some areas are farmed. A severe hazard of erosion and the stones on the surface are the main management concerns. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer also helps to control erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is suited to trees, and a large acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods (fig. 5).

Slope and permeability are the main limitations of the soil for community development.

The capability subclass is IIIe.

26D2—Fauquier stony silt loam, 15 to 25 percent slopes, eroded. This soil is moderately steep and well drained. It is on the lower foot slopes of the Blue Ridge Mountains. The areas of this soil are long and narrow and range from about 15 to 100 acres. Many areas have shallow drainageways about 100 to 400 feet apart. Stones cover less than 1 percent of the surface of the soil.

Typically, the surface layer of this soil is reddish brown silt loam about 7 inches thick. The subsoil is yellowish red and red clay 28 inches thick. The substratum is brownish yellow silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Sylco and Myersville soils that have slopes of more than 25 percent. They make up 10 to 15 percent of the unit. Also included are spots of very stony soils, extremely stony soils, and exposed bedrock. These make up about 5 percent of the unit.

The permeability of this soil is moderate, and the available water capacity is moderate. Surface runoff is rapid. Tilth is fair, and the soil is medium in natural fertility and content of organic matter. The subsoil has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of 40 inches or more. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

Slope and the stones on the surface make this soil poorly suited to cultivated crops. The hazard of erosion is very severe in cultivated areas. The soil is better suited to close-growing crops and to pasture and hay. Some areas are farmed. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and

Figure 5.—Yellow-poplar on an area of Fauquier stony silt loam, 7 to 15 percent slopes, eroded.

control erosion in cultivated areas. Crop residue kept on or in the surface layer also helps to control erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, and a large acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

Slope is the main limitation of this soil for community development.

The capability subclass is IVe.

27E—Fauquier very stony silt loam, 25 to 50 percent slopes. This soil is well drained and steep to very steep. It is on the side slopes of the Blue Ridge Mountains. The areas of this soil are long and winding and range from about 20 to 200 acres. Many areas have shallow drainageways about 100 to 400 feet apart. Stones cover 1 to 3 percent of the surface of the soil.

Typically, the surface layer of this soil is reddish brown silt loam about 7 inches thick. The subsoil is yellowish red and red clay 28 inches thick. The substratum is brownish yellow silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Sylco and Myersville soils that make up 10 to 15 percent of the unit. Also included are

spots of exposed bedrock, stony soils, and extremely stony soils. These make up about 5 percent of the unit.

The permeability of this soil is moderate, and the available water capacity is moderate. Surface runoff is rapid. Tilth is fair, and the soil is medium in natural fertility and content of organic matter. The subsoil has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of 40 inches or more. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

Slope makes this soil generally unsuitable for cultivated crops and poorly suited to pasture. The hazard of erosion is very severe in cleared areas. Maintaining a mixture of grasses and legumes and prevention of overgrazing are major pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is suited to trees, and much of the acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

Slope is the main limitation for community development.

The capability subclass is VIIs.

28A—Fluvaquents, nearly level. This unit consists of somewhat poorly drained to poorly drained, nearly level soils on flood plains of streams and rivers. Runoff is slow on these soils, and they receive seepage and runoff from adjacent uplands. Most areas are subject to periodic flooding. A seasonal high water table is mostly between depths of 1-1/2 and 2-1/2 feet.

Most areas of this unit are in pasture. A few areas are farmed, and a few small areas are wooded. The hazard of flooding and the seasonal high water table are the main limitations for most uses.

The capability subclass is IIIw.

29B2—Frederick and Lodi silt loams, 2 to 7 percent slopes, eroded. This unit consists of gently sloping, well drained soils on knolls and ridges. The areas are irregular in shape and generally range from 3 to 50 acres. Some areas consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 50 percent Frederick soils, 35 percent Lodi soils, and 15 percent other soils.

Typically, the surface layer of the Frederick soils is brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Endcav, Edom, Swimley, and Timberville Variant soils that make up about 10 percent of the unit. Also included are small areas of soils with a surface layer of fine sandy loam, spots of cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is medium. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedock. Both soils are strongly acid or very strongly acid.

These soils are suited to cultivated crops and to pasture and hay. Most areas are farmed. Some areas are used for orchards. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Low strength is the main limitation of the soils for community development.

The capability subclass is IIe.

29C2—Frederick and Lodi silt loams, 7 to 15 percent slopes, eroded. This unit consists of sloping, well drained soils on knolls, ridgetops, and side slopes. The areas are irregular in shape and generally range from 3 to 100 acres. Some areas consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 45 percent Frederick soils, 35 percent Lodi soils, and 20 percent other soils.

Typically, the surface layer of the Frederick soils is brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Endcav, Edom, Swimley, and Timberville Variant soils that make up about 15 percent of this unit. The Timberville Variant soils are generally in low areas adjacent to drainageways. The Endcav, Edom, and Swimley soils are on knolls, ridgetops, and side slopes. Also included are small areas of soils with a surface layer of fine sandy loam, spots of cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are suited to cultivated crops and to pasture and hay. Most areas are farmed. The hazard of erosion is severe in cultivated areas and is a major management concern. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer also helps to control erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope and low strength are the main limitations of the soils for community development.

The capability subclass is IIIe.

29D2—Frederick and Lodi silt loams, 15 to 25 percent slopes, eroded. This unit consists of moderately steep, well drained soils on the side slopes of hills and ridges. The areas are long and narrow and range from about 5 to 100 acres. Some areas consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 40 percent Frederick soils, 40 percent Lodi soils, and 20 percent other soils.

Typically, the surface layer of the Frederick soils is brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Edom, Swimley, and Timberville Variant soils that make up about 15 percent of this unit. The Swimley and Edom soils are on the uplands adjacent to the Frederick and Lodi soils. The Timberville Variant soils are in low areas generally adjacent to drainageways. Also included are small areas of soils with a surface layer of fine sandy loam, spots of cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

Slope makes these soils poorly suited to cultivated crops. The soils are moderately well suited to pasture and hay. Most areas are farmed. The hazard of erosion is very severe in cultivated areas. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are pasture management practices that help to control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation of the soils for community development.

The capability subclass is IVe.

29E2—Frederick and Lodi silt loams, 25 to 45 percent slopes, eroded. This unit consists of steep to very steep, well drained soils on side slopes of hills and ridges. The areas of these soils are mainly long and narrow and range from about 3 to 50 acres. Many of the larger areas have shallow drainageways 50 to 200 feet apart. Some areas consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 45 percent Frederick soils, 45 percent Lodi soils, and 10 percent other soils.

Typically, the surface layer of the Frederick soils is brown silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 6 and 9 inches it is strong brown clay loam. At a depth of more than 9 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 6 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 54 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small areas of soils with a surface layer of fine sandy loam, spots of cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

Slope makes these soils generally unsuitable for cultivated crops. The soils are suited to pasture, and some of the acreage is farmed. The hazard of erosion is very severe in cultivated areas. Maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation of the soils for community development.

The capability subclass is VIe.

30C3—Frederick and Lodi silty clay loams, 7 to 15 percent slopes, severely eroded. This unit consists of sloping, well drained soils on the side slopes and tops of knolls and ridges. These areas are rectangular and range from about 5 to 20 acres. Some areas consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 50 percent Frederick soils, 35 percent Lodi soils, and 15 percent other soils.

Typically, the surface layer of Frederick soils is yellowish red silty clay loam about 6 inches thick. The subsoil is yellowish red and red clay to a depth of 60 inches or more.

The surface layer of the Lodi soils is strong brown silty clay loam about 5 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 55 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Endcav, Edom, and Timberville Variant soils that make up about 10 percent of this unit. The Endcav and Edom soils are on the uplands adjacent to the Frederick and Lodi soils. The Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of silt loam, sinkholes, and small areas of exposed bedrock. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is rapid to very rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

A severe erosion hazard makes these soils poorly suited to cultivated crops. The soils are moderately well suited to pasture and hay. Much of the acreage is farmed. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope and low strength are the main limitations of the soils for community development.

The capability subclass is IVe.

30D3—Frederick and Lodi silty clay loams, 15 to 35 percent slopes, severely eroded. This unit consists of moderately steep to steep, well drained soils on the side slopes of knolls and ridges. The areas are rectangular and range from about 3 to 20 acres. Some areas consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 50 percent Frederick soils, 40 percent Lodi soils, and 10 percent other soils.

Typically, the surface layer of the Frederick soils is yellowish red silty clay loam about 6 inches thick. The subsoil is yellowish red and red clay to a depth of 60 inches or more.

The surface layer of the Lodi soils is strong brown silty clay loam about 5 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 55

inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Swimley and Edom soils that make up about 7 percent of this unit. Also included are small areas of exposed bedrock and sinkholes that make up about 3 percent.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

A severe erosion hazard makes these soils generally unsuitable for cultivated crops. The soils are moderately well suited to pasture and hay. Much of the acreage is farmed. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation of the soils for community development.

The capability subclass is VIe.

31B2—Frederick and Lodi cherty silt loams, 2 to 7 percent slopes, eroded. This unit consists of gently sloping, well drained soils on knolls and ridges. The areas are irregular in shape and generally range from 3 to 30 acres. Some areas consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 50 percent Frederick soils, 35 percent Lodi soils, and 15 percent other soils.

Typically, the surface layer of the Frederick soils is brown cherty silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Endcav, Edom, Swimley, and Timberville Variant soils that make up about 10 percent of this unit. The Endcav, Edom, and Swimley soils are on uplands; the Timberville Variant soils are along drainageways. Also included are small areas of soils with a surface layer of silt loam, spots of very cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is medium. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. A moderate hazard of erosion and the chert in the soil, which damages tillage equipment and interferes with planting, are the main management concerns. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to reduce runoff.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Low strength is the main limitation of these soils for community development.

The capability subclass is IIe.

31C2—Frederick and Lodi cherty silt loams, 7 to 15 percent slopes, eroded. This unit consists of sloping, well drained soils on knolls, ridgetops, and side slopes. The areas are rectangular. They range from about 3 to 50 acres. Some of the larger areas have drainageways 100 to 200 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 45 percent Frederick soils, 35 percent Lodi soils, and 20 percent other soils.

Typically, the surface layer of the Frederick soils is brown cherty silt loam about 7 inches thick. The subsoil, from 7 to 13 inches, is strong brown clay loam. From 13 inches to about 72 inches, the subsoil is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Endcav, Edom, Swimley, and Timberville Variant soils that make up about 15 percent of this unit. The Endcav, Edom, and Swimley soils are on uplands; the Timberville Variant soils are along drainageways. Also included are small areas of soils with a surface layer of silt loam, spots of very cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is medium to rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. A severe hazard of erosion and the chert in the soil, which damages tillage equipment and interferes with planting, are the main management concerns. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to reduce runoff.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Low strength and slope are the main limitations of the soils for community development.

The capability subclass is IIIe.

31D2—Frederick and Lodi cherty silt loams, 15 to 25 percent slopes, eroded. This unit consists of moderately steep, well drained soils on the side slopes of hills and ridges. The areas range from about 3 to 100 acres. Some areas have shallow drainageways 100 to 300 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 45 percent Frederick soils, 40 percent Lodi soils, and 15 percent other soils.

Typically, the surface layer of the Frederick soils is brown cherty silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 7 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Edom, Swimley, and Timberville Variant soils that make up about 10 percent of this unit. The Edom and Swimley soils are on the uplands adjacent to the Frederick and Lodi soils. The Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of silt loam, spots of very cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils. These make up about 5 percent of this unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

Slope makes these soils poorly suited to cultivated crops. The soils are moderately well suited to pasture and hay. Much of the acreage is farmed. The hazard of erosion is very severe and is a major management concern. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils of this unit are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation of these soils for community development.

The capability subclass is IVe.

31E2—Frederick and Lodi cherty silt loams, 25 to 45 percent slopes, eroded. This unit consists of steep, well drained soils on the side slopes of hills and ridges. The areas of these soils mainly are long and narrow and range from about 3 to 50 acres. Many of the larger areas have shallow drainageways 50 to 200 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 50 percent Frederick soils, 40 percent Lodi soils, and 10 percent other soils.

Typically, the surface layer of the Frederick soils is brown cherty silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 6 and 13 inches, it is strong brown clay loam.

At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown cherty silt loam about 6 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 54 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small areas of soils with a surface layer of fine sandy loam, spots of very cherty soils, sinkholes, small areas of exposed bedrock, and spots of severely eroded soils.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils generally are too steep for cultivated crops and are poorly suited to pasture. Some of the acreage is pastured. The hazard of erosion is very severe and is a major management concern. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils of this unit are well suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation of these soils for community development.

The capability subclass is VIe.

32C—Frederick and Lodi very cherty silt loams, 7 to 15 percent slopes. This unit consists of sloping, well drained soils on the side slopes and tops of hills and ridges. The areas of these soils are rectangular and range from 3 to 50 acres. The larger areas have shallow drainageways 50 to 200 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 40 percent Frederick soils, 40 percent Lodi soils, and 20 percent other soils.

Typically, the surface layer of the Frederick soils is brown very cherty silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 7 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown very cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Nixa and Timberville Variant soils that make up about 15 percent of this unit. The Nixa soils are typically on adjacent uplands. The Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of coarse cherty silt loam, spots covered by chert boulders, sinkholes, and small areas of exposed bedrock. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is medium. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are poorly suited to cultivated crops and to pasture and hay. A severe hazard of erosion in cultivated areas and the chert fragments in the soil, which greatly hinder tillage, are the main management concerns. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are suited to trees, and a large acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation of these soils for community development.

The capability subclass is IVs.

32D—Frederick and Lodi very cherty silt loams, 15 to 25 percent slopes. This unit consists of moderately steep, well drained soils on short side slopes of knolls and ridges. The areas of these soils are rectangular and range from about 3 to 50 acres. Many of the larger areas have shallow drainageways about 50 to 100 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 45 percent Frederick soils, 35 percent Lodi soils, and 20 percent other soils.

Typically, the surface layer of the Frederick soils is brown very cherty silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 7 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown very cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Nixa and Timberville Variant soils that make up about 15 percent of this unit. The Nixa soils are typically on adjacent uplands. The Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of coarse cherty silt loam, spots covered by chert boulders, sinkholes, and small areas of exposed bedrock. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are too steep and cherty for cultivated crops and are poorly suited to improved pasture. Maintaining a mixture of grasses and legumes and the prevention of overgrazing are the major pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soils are managed for hardwoods and pine.

Slope is the main limitation of these soils for community development.

The capability subclass is VIs.

32E—Frederick and Lodi very cherty silt loams, 25 to 45 percent slopes. This unit consists of steep to very steep, well drained soils on short side slopes of hills and ridges. The areas of these soils are rectangular and range from about 3 to 60 acres. Many of the larger areas have shallow drainageways about 25 to 100 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Fredrick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 45 percent Frederick soils, 45 percent Lodi soils, and 10 percent other soils.

Typically, the surface layer of the Frederick soils is brown very cherty silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 6 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown very cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small areas of soils with a surface layer of coarse cherty silt loam, sinkholes, and small areas that have exposed bedrock and chert boulders on the surface.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

Slope and the very cherty surface layer make these soils generally unsuitable for cultivated crops and poorly suited to pasture. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soils are managed for hardwoods and pine.

The capability subclass is VIIs.

33B2—Frederick and Lodi silt loams, rocky, 2 to 7 percent slopes, eroded. This unit consists of gently sloping, well drained soils on ridgetops, knolls, and side slopes. The areas of these soils are long and narrow and range from about 3 to 100 acres. Most areas have shallow drainageways 100 to 300 feet apart and bedrock exposures 100 to 300 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 50 percent Frederick soils, 35 percent Lodi soils, and 15 percent other soils.

Typically, the surface layer of Frederick soils is brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Endcav, Edom, Swimley, and Timberville Variant soils that make up about 10 percent of this unit. The Endcav, Edom, and Swimley soils are on the uplands adjacent to the Frederick and Lodi soils. The Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of fine sandy loam, cherty spots, sinkholes, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is

medium. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. The main management concerns are the bedrock exposures, which interfere with tillage, and a moderate to severe hazard of erosion in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

These soils are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

The areas of exposed bedrock are the main limitations of the soils for community development.

The capability subclass is IIe.

33C2—Frederick and Lodi silt loams, rocky, 7 to 15 percent slopes, eroded. This unit consists of sloping, well drained soils on ridgetops, knolls, and side slopes. The areas of these soils are long and winding and range from about 3 to 100 acres. Most areas have shallow drainageways 100 to 300 feet apart and bedrock exposures 100 to 300 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 45 percent Frederick soils, 40 percent Lodi soils, and 15 percent other soils.

Typically, the surface layer of the Frederick soils is brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Endcav, Edom, Swimley, and Timberville Variant soils that make up about 10 percent of this unit. The included Endcav, Edom, and Swimley soils are on uplands adjacent to the Frederick and Lodi soils. The Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of fine sandy loam, spots of cherty soils, sinkholes, small areas of very rocky soils, and spots of very eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is medium to rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. The main management concerns are the bedrock exposures, which interfere with tillage, and a severe hazard of erosion in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils of this unit are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope and the areas of exposed rock are the main limitations of the soils for community development.

The capability subclass is IIIe.

33D2—Frederick and Lodi silt loams, rocky, 15 to 25 percent slopes, eroded. This unit consists of steep, well drained soils on the side slopes of hills and ridges. The areas of these soils are long and winding and range from about 3 to 100 acres. Most areas have shallow drainageways 50 to 200 feet apart and bedrock exposures 100 to 300 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 40 percent Frederick soils, 40 percent Lodi soils, and 20 percent other soils.

Typically, the surface layer of the Frederick soils is brown silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 7 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay

53 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small intermingled areas of Edom, Swimley, and Timberville Variant soils that make up about 15 percent of this unit. The Edom and Swimley soils are on uplands; the Timberville Variant are in low areas along drainageways. Also included are small areas of soils with a surface layer of fine sandy loam, spots of cherty soils, sinkholes, small areas of very rocky soils, and spots of very eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

Slope and the areas of exposed rock make these soils poorly suited to cultivated crops. The soils are moderately well suited to pasture and hay. Much of the acreage is farmed. The hazard of erosion is very severe in cultivated areas. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils of this unit are well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation of these soils for community development.

The capability subclass is IVe.

33E2—Frederick and Lodi silt loams, rocky, 25 to 45 percent slopes, eroded. This unit consists of steep to very steep, well drained soils on short side slopes of hills and ridges. The areas of these soils mostly are rectangular and range from 3 to 30 acres. Most areas of these soils have shallow drainageways 50 to 200 feet apart and bedrock exposures 100 to 300 feet apart. Some areas of this unit consist mostly of Frederick soils, some mostly of Lodi soils, and some of both. The Frederick and Lodi soils were mapped together because they have no major differences in use and management. The total acreage of this unit is about 45 percent Frederick soils, 45 percent Lodi soils, and 10 percent other soils.

Typically, the surface layer of the Frederick soils is brown silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 6 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown silt loam about 6 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 54 inches thick. The substratum is brownish yellow silty clay to a depth of 72 inches or more.

Included with these soils in mapping are small areas of very rocky soils, cherty soils, sinkholes, and severely eroded soils.

The permeability and available water capacity of these Frederick and Lodi soils are moderate. Surface runoff is rapid. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil is high in the Frederick soils and moderate in the Lodi soils. The root zone extends to bedrock. Both soils are strongly acid or very strongly acid.

These soils are too steep for cultivated crops. They are poorly suited to pasture, but some areas are pastured. The hazard of erosion is very severe. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils of this unit are moderately well suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soils are managed for hardwoods and pine.

Slope is the main limitation for community development.

The capability subclass is VIe.

34C—Frederick-Rock outcrop complex, 3 to 15 percent slopes. This unit consists of gently sloping to sloping, well drained soils and of areas of exposed bedrock that are 100 to 300 feet apart. The areas of the unit are long and narrow, are on the side slopes of hills and ridges, and range from about 3 to 100 acres. Most areas have shallow drainageways 100 to 300 feet apart. The unit is about 35 percent Frederick soils, 35 percent exposed bedrock, and 30 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Frederick soils is brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

Included with this unit in mapping are small areas of Endcav, Edom, Swimley, and Timberville Variant soils that make up about 20 to 25 percent of the unit. The Endcav, Edom, and Swimley soils are on uplands; the Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of fine sandy loam, sinkholes, and spots of severely eroded soils. These make up about 5 to 10 percent of the unit.

The permeability and available water capacity of this Frederick soil are moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The subsoil has a high shrink-swell potential in the lower part. The root zone extends to bedrock at a depth of more than 50 inches. The soil is strongly acid or very strongly acid.

The areas of exposed rock make this unit generally unsuitable for row crops. Much of the acreage is in pasture. The hazard of erosion is moderate. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The Frederick soil in this unit is well suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

The areas of exposed bedrock are the main limitation for community development.

The capability subclass is VIs.

34E—Frederick-Rock outcrop complex, 15 to 45 percent slopes. This unit consists of moderately steep to steep soils and of areas of exposed rock 30 to 100 feet apart. The areas of the unit are long and narrow, are on the side slopes of hills and ridges, and range from about 3 to 75 acres. Most have shallow drainageways 50 to 100 feet apart. The unit is about 40 percent Frederick soils, 35 percent exposed rock, and 25 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the surface layer of Frederick soils is brown silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 6 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

Included with these soils in mapping are small areas of Edom, Swimley, and Timberville Variant soils that make up about 20 percent of the unit. The Edom and Swimley soils are on uplands adjacent to the Frederick soils. The Timberville Variant soils are in low areas along drainageways. Also included are small areas of soils with a surface layer of fine sandy loam, sinkholes, and spots of severely eroded soils. These make up about 5 percent of the unit.

The permeability and available water capacity of this Frederick soil are moderate. Surface runoff is rapid to very rapid. The soil is low in natural fertility and organic matter content. The subsoil has a high shrink-swell potential in the lower part. The root zone extends to bedrock at a depth of more than 50 inches. The soil is strongly acid or very strongly acid.

Slope and the areas of exposed rock make this unit poorly suited to cultivated crops. The soil is suited to native pasture and hay. The hazard of erosion is severe. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This Frederick soil is moderately well suited to trees, and a large acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Slope and the areas of exposed rock are the main limitations of this unit for community development.

The capability subclass is VIIs.

35B—Guernsey silt loam, 2 to 7 percent slopes. This soil is gently sloping and moderately well drained. It is in slightly concave areas along drainageways and below mountain foot slopes and is in upland depressions. The areas of this soil are long and narrow or oval. They range from 5 to 25 acres.

Typically, the surface layer is yellowish brown silt loam about 10 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown silty clay, clay, sandy clay loam, and clay loam.

Included with this soil in mapping are small areas of poorly drained soils, small areas covered by stones, and small areas of shaly and very shaly soils. Included soils make up about 10 to 15 percent of this unit.

The permeability of this Guernsey soil is moderately slow to slow, and the available water capacity is moderate. Surface runoff is medium. The soil is medium in natural fertility and low in content of organic matter. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. In unlimed areas, the surface layer and upper part of the subsoil are strongly acid to neutral and the lower part of the subsoil is neutral to moderately alkaline. The soil has a seasonal high water table at a depth of 2 to 3.5 feet during winter and spring.

This soil is suited to cultivated crops if the soil is drained and seepage is controlled. The soil is also suited to pasture and hay, but alfalfa is short lived because of seasonal wetness. The hazard of erosion is moderate and is a major management concern. Minimum tillage and the use of cover crops are practices that increase organic matter and maintain the tilth of the soil. Crop residue kept on or in the surface layer helps to reduce erosion.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer.

This soil is suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

The seasonal high water table and seepage are the main limitations of the soil for community development.

The capability subclass is IIw.

36B—Hawksbill cobbly loam, 2 to 7 percent slopes. This soil is gently sloping and well drained. It is on low terraces adjacent to the flood plains of the major streams between the South Fork of the Shenandoah River and the Blue Ridge Mountains. The soil is in long, narrow areas that range from about 10 to 200 acres.

Typically, the surface layer is dark brown cobbly loam about 9 inches thick. The subsoil is dark brown very cobbly clay loam 27 inches thick. The substratum is brown very cobbly clay loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Typic Udorthents and Craigsville and Unison soils that make up about 20 percent of the unit. The Typic Udorthents are adjacent to the streams; the Craigsville and Unison soils are at higher terrace positions. Also included are small wet spots and very cobbly and very gravelly deposits. These make up less than 5 percent of the unit.

The permeability of this Hawksbill soil is moderate, and the available water capacity is low. The soil is high in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of at least 60 inches. The surface layer and the subsoil are commonly medium acid to neutral. Some areas of this soil are flooded briefly during periods of heavy rain.

This soil is moderately well suited to cultivated crops and suited to pasture and hay. A small acreage is farmed. The main management concerns are the cobblestones and pebbles in the soil, which damage tillage equipment and interfere with planting, and droughtiness during the growing season. Minimum tillage, the use of cover crops and grasses and legumes in the cropping system, and keeping crop residue on or in the surface layer help to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Flooding limits this soil for community development.

The capability subclass is IIIs.

37B—Hawksbill very cobbly loam, 2 to 7 percent slopes. This soil is gently sloping and well drained. It is on low terraces adjacent to the flood plains of the major streams between the South Fork of the Shenandoah River and the Blue Ridge Mountains. The soil is in long, narrow areas that range from about 10 to 100 acres.

Typically, the surface layer is dark brown very cobbly loam about 9 inches thick. The subsoil is dark brown very cobbly clay loam 27 inches thick. The substratum is brown very cobbly clay loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Typic Udorthents and Craigsville soils that make up about 20 percent of the unit. The Typic Udorthents are along the streambanks, and the Craigsville soils are on higher terraces. Also included are small wet spots and extremely cobbly and extremely gravelly areas. These make up less than 5 percent of the unit.

The permeability of this Hawksbill soil is moderate, and the available water capacity is low. The soil is high in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of at least 60 inches. The surface layer and the subsoil are commonly medium acid to neutral. Some areas of this soil are flooded briefly during periods of heavy rainfall.

This soil is poorly suited to cultivated crops and to improved pasture and hay. The cobblestones and pebbles in the soil damage tillage equipment and interfere with planting, and the soil is droughty during the growing season.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

This soil is well suited to trees, and a large acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Flooding limits the soil for community development.

The capability subclass is VIs.

38C—Hawksbill extremely stony loam, 7 to 15 percent slopes. This soil is sloping and well drained. It is on colluvial fans along the western base of the Blue Ridge Mountains. Areas of this soil are irregular in shape and range from about 10 to 100 acres. Stones and boulders cover 15 to 40 percent of the surface.

Typically, the surface layer is dark brown extremely stony loam about 9 inches thick. The subsoil is dark brown very cobbly clay loam 27 inches thick. The substratum is brown very cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Fauquier and Sylco soils that are adjacent to uplands. They make up about 10 percent of the unit. Also included are small wet spots that make up about 2 percent of the unit.

The permeability of this Hawksbill soil is moderate, and the available water capacity is low. The soil is high in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to bedrock at a depth of at least 60 inches. The surface layer and the subsoil commonly are medium acid to neutral. Some areas of this soil are flooded briefly during periods of heavy rainfall.

Slope, the stones on the surface, and droughtiness during the growing season make this soil unsuitable for cultivated crops and poorly suited to pasture and hay. The hazard of erosion is severe in unprotected areas.

This soil is well suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Flooding and the stones and boulders on the surface limit this soil for community development.

The capability subclass is VIIs.

39B—Laidig gravelly fine sandy loam, 2 to 7 percent slopes. This soil is gently sloping and well drained. It is on broad, slightly concave mountain foot slopes and fans. The areas of this soil are long and winding or triangular and range from 5 to 100 acres.

Typically, the surface layer of this soil is yellowish brown gravelly fine sandy loam about 6 inches thick. The subsoil extends a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small areas of Buchanan, Monongahela, Sequoia, and Unison soils that make up about 10 to 15 percent of this unit. The Buchanan and Monongahela soils are generally along the lower slopes of the unit. The Sequoia soils are on small ridges and knolls. The Unison soils are on mountain foot slopes and fans. Also included are spots of stony soils and soils with a cobbly surface layer. These make up about 5 percent of the unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is medium. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil commonly are very strongly acid to strongly acid.

This soil is suited to cultivated crops and to pasture and hay. A large acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth, and the soil is droughty during the growing season. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

The seasonal high water table and permeability of the soil are the main limitations for community development.

The capability subclass is IIe.

39C—Laidig gravelly fine sandy loam, 7 to 15 percent slopes. This soil is sloping and well drained. It is on broad, slightly concave mountain foot slopes and fans crossed by shallow drainageways 100 to 400 feet apart. The areas of this soil are long and winding or triangular and range from 5 to 80 acres.

Typically, the surface layer of this soil is yellowish brown gravelly fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Buchanan, Monongahela, Sequoia, and Unison soils that make up about 10 to 15 percent of this unit. The Buchanan and Monongahela soils are on lower and less sloping areas. The Sequoia and Unison soils are interspersed with this Laidig soil. Also included are spots of stony soils and soils with a cobbly surface layer. These make up about 5 percent of the unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

This soil is moderately suited to cultivated crops and to pasture and hay. A large acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth, and the soil is droughty during the growing season. The hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and

control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to maintain tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

The seasonal high water table and permeability of the soil are the main limitations for community development.

The capability subclass is IIIe.

40B—Laidig cobbly fine sandy loam, 2 to 7 percent slopes. This soil is gently sloping and well drained. It is on broad, concave mountain foot slopes and fans. The areas of this soil are long and winding or triangular and range from 5 to 125 acres.

Typically, the surface layer of this soil is yellowish brown cobbly fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Buchanan, Monongahela, Sequoia, and Unison soils that make up about 10 to 15 percent of this unit. The Buchanan and Monongahela soils are generally in less sloping areas near the edge of this unit. The Sequoia soils are on knolls. The Unison soils are on mountain foot slopes and fans. Also included are spots of stony soils and soils with a surface layer of fine sandy loam. These make up about 5 percent of this unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is medium. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

This soil is moderately suited to cultivated crops and to pasture and hay. Some areas are farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth. The soil is droughty during the growing season, and cobblestones and pebbles in the soil damage tillage equipment and interfere with planting. The hazard of erosion is moderate to severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

The seasonal high water table and permeability of the soil are the main limitations for community development.

The capability subclass is IIIe.

40C—Laidig cobbly fine sandy loam, 7 to 15 percent slopes. This soil is sloping and well drained. It is on broad, concave mountain foot slopes and fans. The areas of this soil are long and winding or triangular. They range from 5 to 150 acres.

Typically, the surface layer of this soil is yellowish brown cobbly fine sandy loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Buchanan, Monongahela, Sequoia, and Unison soils that make up about 10 to 15 percent of this unit. The Buchanan and Monongahela soils are in lower and less sloping areas. The Sequoia and Unison soils are interspersed with this Laidig soil. Also included are spots of stony soils and soils with a surface layer of fine sandy loam. These make up about 5 percent of this unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

Slope and droughtiness during the growing season make this soil poorly suited to cultivated crops. The soil is suited to pasture and hay, but alfalfa commonly is short lived because of seasonal wetness and restricted root growth. Some areas are farmed. The hazard of erosion is very severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas.

Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Slope, the seasonal high water table, and the permeability of the soil are the main limitations for community development.

The capability subclass is IVe.

40D—Laidig cobbly fine sandy loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. It is on broad, concave mountain foot slopes and areas between foot slopes and terraces. The areas of this soil are long and winding and range from 5 to 100 acres. They are crossed by shallow drainageways about 100 to 400 feet apart.

Typically, the surface layer of this soil is yellowish brown cobbly fine sandy loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Berks and Buchanan soils that make up about 10 to 15 percent of this unit. The Berks soils are interspersed with this Laidig soil or are near the top of the slope; the Buchanan soils are on lower slopes and less sloping areas. Also included are spots of stony soils and soils with a surface layer of fine sandy loam. These make up about 5 percent of the unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

Slope and droughtiness during the growing season make this soil poorly suited to cultivated crops. The soil is moderately well suited to pasture and hay. The hazard of erosion is severe. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and most of the acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

The seasonal high water table, permeability, and slope of the soil are the main limitations for community development.

The capability subclass is VIe.

40E—Laidig cobbly fine sandy loam, 25 to 45 percent slopes. This soil is steep and well drained. It is in narrow, concave areas between mountain side slopes and terraces. The areas of this soil are long and winding and range from 5 to 100 acres. They are crossed by drainageways about 100 to 400 feet apart.

Typically, the surface layer of this soil is yellowish brown cobbly fine sandy loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Berks and Sherando soils that make up about 10 to 15 percent of this unit. Also included are spots of stony soils and soils with a surface layer of fine sandy loam. These make up about 5 percent of the unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

Slope and droughtiness during the growing season make this soil unsuitable for cultivated crops and poorly suited to pasture. The hazard of erosion is very severe. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a large acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Slope is the main limitation of this soil for community development.

The capability subclass is VIIe.

41C—Laidig very stony fine sandy loam, 7 to 15 percent slopes. This soil is sloping and well drained. It is on broad, concave mountain foot slopes and fans crossed by shallow drainageways about 100 to 400 feet apart. The areas of this soil are long and winding or triangular and range from 10 to 100 acres. Stones cover about 3 to 15 percent of the surface.

Typically, the surface layer of this soil is yellowish brown fine sandy loam about 10 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam, clay, and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Berks, Buchanan, Sequoia, and Shelocta Variant soils that make up about 10 to 15 percent of this unit. Also included are spots of soils that are extremely stony or rubbly and make up about 5 percent of the unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

Slope, droughtiness during the growing season, and the stones on the surface make this soil unsuitable for cultivated crops and poorly suited to pasture. The hazard of erosion is severe in unprotected areas. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

The seasonal high water table, the permeability of the soil, and the stones on the surface are the main limitations for community development.

The capability subclass is VIs.

41D—Laidig very stony fine sandy loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. It is on broad, concave mountain foot slopes crossed by shallow drainagways about 100 to 300 feet apart. The areas of this soil are long and winding and range from 5 to 100 acres. Stones cover about 3 to 15 percent of the surface.

Typically, the surface layer of this soil is yellowish brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam, clay, and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Berks, Drall, and Weikert soils that make up 10 to 15 percent of this unit. Also included are spots of extremely stony or rubbly soils that make up about 5 percent of the unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

Slope, droughtiness during the growing season, and the stones on the surface make this soil unsuitable for cultivated crops and poorly suited to pasture. The hazard of erosion is severe in unprotected areas. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

The seasonal high water table, the permeability of the soil, the stones on surface, and slope are the main limitations for community development.

The capability subclass is VIs.

41E—Laidig very stony fine sandy loam, 25 to 45 percent slopes. This soil is steep and well drained. It is on broad, concave mountain foot slopes crossed by drainageways about 100 to 300 feet apart. The areas of this soil are long and winding and range from 20 to 1,000 acres. Stones cover about 3 to 15 percent of the surface.

Typically, the surface layer of this soil is yellowish brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown fine sandy loam, clay, and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

Included with this soil in mapping are small intermingled areas of Berks, Drall, and Weikert soils that

make up 10 to 15 percent of this unit. Also included are spots of extremely stony or rubbly soils that make up about 5 percent of the unit.

The permeability of this Laidig soil is moderately slow, and the available water capacity is low to moderate. Surface runoff is rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 30 to 50 inches. A seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and the subsoil in unlimed areas of the soil are commonly very strongly acid to strongly acid.

Slope and the stones on the surface make this soil generally unsuitable for farming. The soil is suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

Slope is the main limitation of this soil for community development.

The capability subclass is VIIs.

42C—Laidig-Buchanan extremely stony loams, 7 to 20 percent slopes. This unit consists of sloping and moderately steep, well drained and somewhat poorly soils in broad, slightly concave areas at the heads of drainageways and along drainageways and fans. Sandstone and quartzite stones cover 15 to 50 percent of the surface. The areas of this complex are irregular in shape and range from about 40 to 100 acres. They are about 50 percent Laidig soils, 40 percent Buchanan soils, and 10 percent other soils. The Laidig and Buchanan soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Laidig soils is yellowish brown sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is mostly yellowish brown, fine sandy loam, clay loam, and cobbly clay loam to a depth of 41 inches. At a depth of more than 41 inches, it is yellowish brown, firm cobbly fine sandy loam.

The surface layer of the Buchanan soils is yellowish brown fine sandy loam about 7 inches thick. The subsoil is 35 inches thick. The upper 14 inches is mostly yellowish brown loam and sandy clay loam. The lower 21 inches is light yellowish brown or yellowish brown, firm cobbly fine sandy loam and cobbly sandy loam. The substratum is yellowish brown cobbly sandy clay loam to a depth of 60 inches or more.

Included with these soils in mapping are small rubbly areas.

The permeability of these Laidig and Buchanan soils is moderately slow, and the available water capacity is low. Runoff is medium to rapid. The soils are low in natural fertility and content of organic matter. The root zone extends to the firm part of the subsoil in each soil, and a seasonal high water table is perched on the firm part of the subsoil in winter and spring. The surface layer and subsoil of these soils are commonly very strongly acid to strongly acid.

Slope, the stones on the surface, and droughtiness during the growing season make these soils generally unsuitable for cultivated crops and poorly suited to pasture. Some areas are used for native pasture. Maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils are moderately well suited to trees, and most of the acreage is wooded. Potential productivity is moderate. The soils are managed for hardwoods and pine.

Slope, the seasonal high water table, the permeability of the soils, and the stones on the surface are the main limitations for community development.

The capability subclass is VIIs.

43C—Lehew, Dekalb, and Calvin cobbly soils, 5 to 15 percent slopes. This unit consists of sloping, well drained soils on the tops of broad ridges in the Appalachian Mountains. The areas are long and narrow and range from about 25 to 150 acres. Cobblestones and flagstones cover about 2 percent of the surface.

Some areas of this unit consist mostly of Lehew, Dekalb, or Calvin soils, and some consist of a combination of the three. The soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 35 percent Lehew soils, 30 percent Dekalb soils, 25 percent Calvin soils, and 10 percent other soils.

Typically, the surface layer of the Lehew soils is dark reddish brown cobbly fine sandy loam about 7 inches thick. The subsoil is reddish brown fine sandy loam and very channery loam 16 inches thick. The substratum is reddish brown very channery loam to a depth of about 29 inches. Interbedded sandstone and shale are at a depth of about 29 inches.

The surface layer of the Dekalb soils is very dark gray and dark gray fine sandy loam and cobbly fine sandy loam about 6 inches thick. The subsoil is dark yellowish brown and yellowish brown channery fine sandy loam and flaggy fine sandy loam 28 inches thick. Sandstone is at a depth of 34 inches.

The surface layer of the Calvin soils mostly is reddish brown cobbly loam about 7 inches thick. The subsoil is reddish brown very shaly loam 14 inches thick. The substratum is reddish brown very flaggy loam to a depth of 26 inches. Shale is at a depth of 26 inches.

Included with these soils in mapping are small areas of Berks soils, small areas of soils that have bedrock at a depth of less than 20 inches, small areas of soils that have bedrock at a depth of more than 30 inches, small

areas of exposed bedrock, and small areas of stony soils.

The permeability of these Lehew, Dekalb, and Calvin soils is moderately rapid, and the available water capacity is low. Runoff is medium to rapid. The soils are low in natural fertility and content of organic matter. The root zone extends to bedrock in each soil but is restricted at a depth of about 15 inches by the high content of sandstone and shale fragments and flagstones. The surface layer and subsoil in unlimed areas of these soils are very strongly acid to medium acid.

Droughtiness during the growing season makes these soils poorly suited to cultivated crops. The soils are moderately well suited to pasture and hay. The hazard of erosion is very severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils are moderately well suited to trees, and most of the acreage is wooded. Potential productivity is moderate. The soils are managed for pine and hardwoods.

The depth to bedrock is the main limitation of these soils for community development.

The capability subclass is IVe.

43D—Lehew, Dekalb, and Calvin cobbly soils, 15 to 25 percent slopes. This unit consists of moderately steep, well drained soils on the tops of broad ridges in the Appalachian Mountains. The areas are long and narrow and range from about 25 to 150 acres. Cobblestones and flagstones cover about 2 percent of the surface.

Some areas of this unit consist mostly of Lehew, Dekalb, or Calvin soils, and some consist of a combination of the three. The soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 35 percent Lehew soils, 30 percent Dekalb soils, 25 percent Calvin soils, and 10 percent other soils.

Typically, the surface layer of the Lehew soils is dark reddish brown cobbly fine sandy loam about 7 inches thick. The subsoil is reddish brown fine sandy loam and very channery loam 16 inches thick. The substratum is reddish brown very channery loam to a depth of about 29 inches. Interbedded sandstone and shale are at a depth of about 29 inches.

The surface layer of the Dekalb soils is very dark gray and dark gray fine sandy loam and cobbly fine sandy loam about 6 inches thick. The subsoil is dark yellowish brown and yellowish brown channery fine sandy loam and flaggy fine sandy loam 28 inches thick. Sandstone is at a depth of 34 inches.

The surface layer of the Calvin soils mostly is reddish brown cobbly loam about 7 inches thick. The subsoil is reddish brown very shaly loam 14 inches thick. The substratum is reddish brown very flaggy loam to a depth of 26 inches. Shale is at a depth of 26 inches.

Included with these soils in mapping are small areas of Berks soils, small areas of soils that have bedrock at a depth of less than 20 inches, small areas of soils that have bedrock at a depth of 48 inches or more, small areas of exposed bedrock, and small areas of stony soils.

The permeability of these Lehew, Dekalb, and Calvin soils is moderately rapid, and the available water capacity is low. Runoff is rapid. The soils are low in natural fertility and content of organic matter. The root zone extends to bedrock in each soil but is restricted at a depth of about 15 inches by the high content of sandstone and shale fragments and flagstones. The surface layer and subsoil in unlimed areas of these soils are very strongly acid to medium acid.

Slope and droughtiness during the growing season make these soils unsuited to cultivated crops. The soils are moderately well suited to pasture and hay. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soils are moderately well suited to trees, and most of the acreage is wooded. Potential productivity is moderate. The soils are managed for pine and hardwoods.

Slope and the depth to bedrock are the main limitations of these soils for community development.

The capability subclass is VIe.

44E—Lehew, Dekalb, and Calvin very stony soils, 25 to 45 percent slopes. This unit consists of steep, well drained soils on long side slopes in the Appalachian Mountains. The areas are long and narrow and range from about 50 to 500 acres. Stones cover about 3 to 15 percent of the surface.

Some areas of this unit consist mostly of Lehew, Dekalb, or Calvin soils, and some consist of a combination of the three. The soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 30 percent Lehew soils, 25 percent Dekalb soils, 20 percent Calvin soils, and 25 percent other soils.

Typically, the surface layer of the Lehew soils is dark reddish brown fine sandy loam about 7 inches thick. The subsoil is reddish brown fine sandy loam and very

channery loam about 16 inches thick. The substratum is reddish brown very channery loam to a depth of 29 inches. Interbedded sandstone and shale are at a depth of 29 inches.

The surface layer of the Calvin soils mostly is reddish brown shaly loam about 7 inches thick. The subsoil is reddish brown very shaly loam about 14 inches thick. The substratum is reddish brown very flaggy loam to a depth of 26 inches. Shale is at a depth of 26 inches.

The surface layer of the Dekalb soils is very dark gray and dark gray fine sandy loam and channery fine sandy loam about 6 inches thick. The subsoil is dark yellowish brown and yellowish brown channery fine sandy loam and flaggy fine sandy loam about 28 inches thick. Sandstone is at a depth of 34 inches.

Included with these soils in mapping are small areas of Berks soils, small areas of soils that have bedrock at a depth of less than 20 inches, small areas of soils that have bedrock at a depth of 48 inches, small areas of exposed bedrock, and small areas of extremely stony soils at the heads of and along drainageways.

The permeability of these Lehew, Dekalb, and Calvin soils is moderately rapid, and the available water capacity is low. Runoff is rapid. The soils are low in natural fertility and content of organic matter. The root zone extends to bedrock in each soil but is restricted at a depth of about 15 inches by the high content of sandstone and shale fragments and flagstones. The surface layer and subsoil in unlimed areas of these soils are very strongly acid to medium acid.

Slope, droughtiness during the growing season, and the stones on the surface make these soils poorly suited to farming. The hazard of erosion is very severe.

The soils are moderately well suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soils are managed for pine and hardwoods.

Slope and the depth to bedrock limit these soils for community development.

The capability subclass is VIIs.

44F—Lehew, Dekalb, and Calvin very stony soils, 45 to 65 percent slopes. This unit consists of steep, well drained soils on long side slopes in the Appalachian Mountains. The areas are long and narrow and range from about 50 to 1,000 acres. Stones cover about 3 to 15 percent of the surface.

Some areas of this unit consist mostly of Lehew, Dekalb, or Calvin soils, and some consist of a combination of the three. The soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 30 percent Lehew soils, 25 percent Dekalb soils, 20 percent Calvin soils, and 25 percent other soils.

Typically, the surface layer of the Lehew soils is dark reddish brown fine sandy loam about 7 inches thick. The subsoil is reddish brown fine sandy loam and very channery loam about 16 inches thick. The substratum is reddish brown very channery loam to a depth of 29 inches. Interbedded sandstone and shale are at a depth of 29 inches.

The surface layer of the Calvin soils mostly is reddish brown shaly loam about 7 inches thick. The subsoil is reddish brown very shaly loam about 14 inches thick. The substratum is reddish brown very flaggy loam to a depth of 26 inches. Shale is at a depth of 26 inches.

The surface layer of the Dekalb soils is very dark gray and dark gray fine sandy loam and channery fine sandy loam about 6 inches thick. The subsoil is dark yellowish brown and yellowish brown channery fine sandy loam and flaggy fine sandy loam about 28 inches thick. Sandstone is at a depth of 34 inches.

Included with these soils in mapping are small areas of Berks soils, small areas of soils that have bedrock at a depth of less than 20 inches, small areas of soils that have bedrock at a depth of 48 inches, small areas of exposed bedrock, and small areas of extremely stony soils at the heads of and along drainageways.

The permeability of these Lehew, Dekalb, and Calvin soils is moderately rapid, and the available water capacity is low. Runoff is rapid. The soils are low in natural fertility and content of organic matter. The root zone extends to bedrock in each soil but is restricted at a depth of about 15 inches by the high content of sandstone and shale fragments and flagstones. The surface layer and subsoil in unlimed areas of these soils are very strongly acid to medium acid.

Slope and the stones on the surface make these soils unsuitable for farming. The soils are moderately well suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soils are managed for pine and hardwoods.

Slope and the depth to bedrock are the main limitations for community development.

The capability subclass is VIIs.

45A—Massanetta silt loam, 0 to 2 percent slopes. This soil is nearly level and moderately well drained. It is on small, narrow flood plains mainly near springs. The areas of this soil commonly are long and narrow and range from 3 to 150 acres.

Typically, the surface layer is very dark grayish brown silt loam about 11 inches thick. The subsoil is gray and dark gray clay loam about 14 inches thick. The substratum extends to a depth of 80 inches or more. Between depths of 25 inches and 64 inches, it is gray loam and silt loam. At a depth of more than 64 inches, it is yellowish brown clay.

Included with this soil in mapping are small areas of Aquic Udifluvents that make up about 5 percent of this unit. Also included are a few small wet areas, cobbly areas, and gravelly areas. These make up about 5 percent of the unit.

The permeability of this Massanetta soil is moderate, and the available water capacity is moderate. Surface runoff is slow. The soil is high in natural fertility and moderate to high in organic matter content. The root zone generally extends to bedrock at a depth of more than 60 inches. The surface layer and subsoil are mildly alkaline or moderately alkaline. The seasonal high water table is between depths of 2 and 3.5 feet in winter and early spring, and the soil is subject to flooding during periods of high rainfall.

This soil is moderately well suited to cultivated crops and well suited to pasture and hay. Much of the acreage is in pasture. Alfalfa is short lived because of seasonal wetness, and occasional flooding is a hazard to crops. The use of cover crops and grasses and legumes in the cropping system and keeping crop residue on or in the surface layer are practices that help to maintain organic matter content and tilth in cultivated areas.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, but only a very small acreage is wooded. Potential productivity is high. The soil is managed for pine and hardwoods.

The seasonal high water table and flooding are the main limitations of the soil for community development.

The capability subclass is IIw.

46A—Millrock loamy sand, 0 to 4 percent slopes. This soil is nearly level to gently sloping and is well drained. It is on small flood plains bordering the major streams and rivers. The areas of this soil are commonly long and narrow and range from 3 to 100 acres.

Typically, the surface layer is dark brown loamy sand about 6 inches thick. The subsoil is brown loamy sand 8 inches thick. The underlying layer extends to a depth of 60 inches or more. It is dark brown and brown loamy sand stratified with a thin layer of reddish brown fine sandy loam.

Included with this soil in mapping are small intermingled areas of Buckton, Chavies, Wheeling, Tioga, and Craigsville soils. These soils are typically farther from the stream or river than this Millrock soil. Also included are areas that have cobblestones or gravel on the surface. Included areas make up 10 to 35 percent of this unit.

The permeability of this Millrock soil is rapid, and the available water capacity is low. Surface runoff is slow, and the soil is flooded for very brief periods. The soil is medium in natural fertility and low in organic matter content. The root zone extends to bedrock at a depth of 60 inches or more. The surface layer and subsoil are slightly acid or neutral.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The low available water capacity is the major limitation for crops. Minimum tillage, the use of cover crops and grasses and legumes in the cropping system, and keeping crop residue on or in the surface layer help to improve tilth and prevent flood scouring.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soil is well suited to trees, but only a small acreage is woodland. Potential productivity is high. The soil is managed for hardwoods and pine.

Flooding is the main limitation of this soil for community development.

The capability subclass is IIIs.

47B—Monongahela fine sandy loam, 0 to 7 percent slopes. This soil is gently sloping and moderately well drained. It is on broad terraces along rivers and major streams. The areas of this soil commonly are irregular in shape and range from 3 to 50 acres.

Typically, the surface layer is brown to dark brown fine sandy loam about 10 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 14 inches of the subsoil is yellowish brown and pale brown loam and is mottled in the lower part. The middle part is 9 inches of very firm, pale brown, mottled loam. The lower part is strong brown, mottled loam and yellowish red and red, mottled clay loam or clay.

Included with this soil in mapping are small intermingled areas of Allegheny, Purdy, Cotaco, and Buchanan soils that make up about 20 percent of this unit. They are on terraces. Also included are spots of soils with a surface layer of silt loam or a cobbly surface layer. These make up about 5 percent of the unit.

The permeability of this Monongahela soil is moderate above the firm part of the subsoil and moderately slow or slow in the firm part. The available water capacity of the soil is moderate. Surface runoff is medium. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 20 to 30 inches, and a seasonal high water table is perched on the firm part in winter and spring. The surface layer and subsoil in unlimed areas are commonly strongly acid or very strongly acid.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth, and the soil is droughty during the growing season. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the

cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The seasonal high water table and the permeability of the firm part of the subsoil are the main limitations for community development.

The capability subclass is IIw.

47C2—Monongahela fine sandy loam, 7 to 15 percent slopes, eroded. This soil is sloping and moderately well drained. It is on broad terraces along rivers and major streams. The areas of this soil commonly are irregular in shape and range from 3 to 60 acres.

Typically, the surface layer is brown to dark brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 17 inches of the subsoil is yellowish brown and pale brown loam and is mottled in the lower part. The middle part is 9 inches of very firm, pale brown, mottled loam. The lower part is strong brown, mottled loam and yellowish red and red, mottled clay loam or clay.

Included with this soil in mapping are small intermingled areas of Allegheny, Purdy, Cotaco, and Buchanan soils that make up about 20 percent of this unit. They are on terraces. Also included are spots of soils with a surface layer of silt loam or a cobbly surface layer. These make up about 5 percent of the unit.

The permeability of this Monongahela soil is moderate above the firm part of the subsoil and moderately slow or slow in the firm part. The available water capacity of the soil is moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 20 to 30 inches, and a seasonal high water table is perched on the firm part in winter and spring. The surface layer and subsoil in unlimed areas are commonly strongly acid or very strongly acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth, and the soil is droughty during the growing season. The hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The seasonal high water table and the permeability of the firm part of the subsoil are the main limitations for community development.

The capability subclass is IIIe.

48B—Monongahela cobbly fine sandy loam, 0 to 7 percent slopes. This soil is gently sloping and moderately well drained. It is on broad terraces along rivers and major streams. The areas of this soil commonly are irregular in shape and range from 3 to 50 acres.

Typically, the surface layer is brown to dark brown cobbly fine sandy loam about 10 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 14 inches of the subsoil is yellowish brown and pale brown loam and is mottled in the lower part. The middle part is 9 inches of very firm, pale brown, mottled loam. The lower part is strong brown, mottled loam and yellowish red and red, mottled clay loam or clay.

Included with this soil in mapping are small intermingled areas of Allegheny, Purdy, Cotaco, and Buchanan soils that make up 20 percent of this unit. The Purdy soils are in the more nearly level or depressional part of the terrace. The Cotaco soils are on the same landscape as this Monongahela soil. The Buchanan soils are generally near adjacent uplands. The Allegheny soils typically are near the stream. Also included are spots of soils with a surface layer of silt loam that make up about 5 percent of the unit.

The permeability of this Monongahela soil is moderate above the firm part of the subsoil and moderately slow or slow in the firm part. The available water capacity of the soil is moderate. Surface runoff is medium. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 20 to 30 inches, and a seasonal high water table is perched on the firm part in winter and spring. The surface layer and subsoil in unlimed areas are commonly strongly acid or very strongly acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. A moderate acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth. The soil is droughty during the growing season, and cobblestones and

pebbles in the soil damage tillage equipment and interfere with planting. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The seasonal high water table and the permeability of the firm part of the subsoil are the main limitations for community development.

The capability subclass is IIw.

48C—Monongahela cobbly fine sandy loam, 7 to 15 percent slopes. This soil is sloping and moderately well drained. It is on broad terraces along rivers and major streams. The areas of this soil commonly are irregular in shape and range from 3 to 70 acres.

Typically, the surface layer is brown to dark brown cobbly fine sandy loam about 10 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 14 inches of the subsoil is yellowish brown and pale brown loam and is mottled in the lower part. The middle part is 9 inches of very firm, pale brown, mottled loam. The lower part is strong brown, mottled loam and yellowish red and red, mottled clay loam or clay.

Included with this soil in mapping are small intermingled areas of Allegheny, Purdy, Cotaco, and Buchanan soils that make up 20 percent of this unit. The Purdy soils are in the more nearly level or depressional part of the terrace. The Buchanan inclusions are generally near adjacent uplands. The Cotaco soils are on the same landscape as this Monongahela soil. The Allegheny soils typically are near the stream. Also included are spots of soils with a surface layer of silt loam that make up about 5 percent of the unit.

The permeability of this Monongahela soil is moderate above the firm part of the subsoil and moderately slow or slow in the firm part. The available water capacity of the soil is moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The root zone extends to the firm part of the subsoil, commonly at a depth of about 20 to 30 inches, and a seasonal high water table is perched on the firm part in winter and spring. The surface layer and subsoil in unlimed areas are commonly strongly acid or very strongly acid.

This soil is poorly suited to cultivated crops and moderately well suited to pasture and hay. A moderate acreage is farmed. Alfalfa commonly is short lived because of seasonal wetness and restricted root growth. The soil is droughty during the growing season, and cobblestones and pebbles in the soil damage tillage equipment and interfere with planting. The hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The seasonal high water table and the permeability of the firm part of the subsoil are the main limitations for community development.

The capability subclass is IIIe.

49C—Myersville very stony silt loam, 7 to 15 percent slopes. This soil is sloping and well drained. It is on ridegetops of the Blue Ridge Mountains. Stones cover about 3 to 15 percent of the surface. The areas of this soil are long and narrow and range from about 20 to 100 acres.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsoil is about 25 inches thick. It is mostly strong brown silty clay loam and cobbly silty clay loam. The substratum is strong brown, brownish yellow, and yellowish red very cobbly silt loam 14 inches thick. Weathered greenstone bedrock is at a depth of 44 inches.

Included with this soil in mapping are small intermingled areas of Fauquier soils that make up 10 to 15 percent of this unit. Also included are small areas of extremely stony soils and exposed bedrock. These make up about 5 percent of the unit.

The permeability of this Myersville soil is moderate, and the available water capacity is moderate. The soil is medium to high in natural fertility and moderately low in organic matter content. Surface runoff is medium to rapid. The root zone extends to bedrock at a depth of 3-1/2 feet or more. The surface layer and subsoil in unlimed areas are commonly medium acid to very strongly acid.

The stones on the surface and a very severe hazard of erosion make this soil generally unsuited to cultivated crops and poorly suited to pasture. Establishing and maintaining a mixture of grasses and legumes and the

prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soil is suited to trees, and much of the acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwods.

Slope and the stones on the surface are the main limitations of the soil for community development.

The capability subclass is VIs.

49D—Myersville very stony silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. It is on the ridgetops and upper side slopes of the Blue Ridge Mountains. Stones cover about 3 to 15 percent of the surface. The areas of this soil are long and winding and range from about 30 to 300 acres.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsoil is about 25 inches thick. It is mostly strong brown silty clay loam and cobbly silty clay loam. The substratum is strong brown, brownish yellow, and yellowish red very cobbly silt loam 14 inches thick. Weathered greenstone bedrock is at a depth of 44 inches.

Included with this soil in mapping are small intermingled areas of Fauquier soils that make up 10 to 15 percent of this unit. Also included are small areas of extremely stony soils and exposed bedrock. These make up about 5 percent of the unit.

The permeability of this Myersville soil is moderate, and the available water capacity is moderate. The soil is medium to high in natural fertility and moderately low in organic matter content. Surface runoff is medium to rapid. The root zone extends to bedrock at a depth of 3-1/2 feet or more. The surface layer and subsoil in unlimed areas are commonly medium acid to very strongly acid.

Slope and the stones on the surface make this soil generally unsuited to cultivated crops and suited only to native pasture. The hazard of erosion is very severe in cleared areas.

The soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The slope and the stones on the surface are the main limitations for community development.

The capability subclass is VIIs.

49F—Myersville very stony silt loam, 25 to 60 percent slopes. This soil is steep and well drained. It is on the upper side slopes of the Blue Ridge Mountains and is dissected by drainageways about 100 to 400 feet apart. Stones cover about 3 to 15 percent of the surface of the soil. The areas of this soil are long and winding and range from about 100 to 1,000 acres.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsoil is about 25 inches thick. It is mostly strong brown silty clay loam and cobbly silty clay loam. The substratum is strong brown, brownish yellow, and yellowish red very cobbly silt loam 14 inches thick. Weathered greenstone bedrock is at a depth of 44 inches.

Included with this soil in mapping are small intermingled areas of Fauquier soils that make up 10 to 15 percent of this unit. Also included are small areas of extremely stony soils and exposed bedrock. These make up about 10 percent of the unit.

The permeability of this Myersville soil is moderate, and the available water capacity is moderate. The soil is medium to high in natural fertility and moderately low in organic matter content. Surface runoff is rapid. The root zone extends to bedrock at a depth of 3-1/2 feet or more. The surface layer and subsoil in unlimed areas are commonly medium acid to very strongly acid.

Slope and the stones on the surface make this soil generally unsuitable for farming. The soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

The slope and the stones on the surface are the main limitations for community development.

The capability subclass is VIIs.

50B—Nixa, Frederick-Lodi cherty silt loams, 2 to 7 percent slopes. This unit consists of gently sloping, well drained to moderately well drained soils at the base of and along the lower slopes of cherty knolls and ridges. The areas of this unit are long and narrow and range from 3 to 15 acres. They are about 40 percent Nixa soils, 35 percent Frederick soils, 15 percent Lodi soils, and 10 percent other soils. The Nixa, Frederick, and Lodi soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Nixa soils is light yellowish brown cherty silt loam about 16 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 16 and 39 inches, it is a very firm layer of mottled, light gray very cherty silt loam. At a depth of more than 39 inches, it is brown and yellowish brown cherty silty clay and cherty silt loam.

The surface layer of the Frederick soils is brown cherty silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silt loam to a depth of 72 inches or more.

Included with these soils in mapping are small low areas along drainageways of Timberville Variant soils that make up 5 percent of this unit. Also included are

small wet areas along drainageways and a few small sinkholes. These make up about 5 percent of the unit.

Permeability is very slow in these Nixa soils and moderate in these Frederick and Lodi soils. Available water capacity is very low in the Nixa soils and moderate in the Frederick and Lodi soils. Surface runoff is slow to medium. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil of these soils is mainly low to moderate but is high in the lower part of the Frederick soils. The root zone extends to a depth of about 16 inches in the Nixa soils and 50 inches in the Frederick and Lodi soils. The surface layer of these soils commonly is medium acid to strongly acid, and the subsoil is strongly acid to very strongly acid.

This unit is moderately well suited to cultivated crops and to pasture and hay. Much of the acreage is in pasture. Chert in the surface layer of these soils interferes with tillage and seeding, and the Nixa soils are very droughty during the growing season. The hazard of erosion is moderate. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soils are suited to trees, and a moderate acreage is wooded. Potential productivity is moderate to high. The soils are managed for hardwoods and pine.

The very slow permeability of the Nixa soils is the main limitation of the unit for community development.

The capability subclass is IIIe.

50C—Nixa-Frederick-Lodi cherty silt loams, 7 to 15 percent slopes. This unit consists of sloping, well drained to moderately well drained soils at the base of or along the lower slopes of cherty knolls and ridges. The areas of this complex are long and narrow and range from 3 to 15 acres. They are about 35 percent Nixa soils, 30 percent Frederick soils, 25 percent Lodi soils, and 10 percent other soils.

Typically, the surface layer of the Nixa soils is light yellowish brown cherty silt loam about 16 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 16 and 39 inches, it is a very firm layer of mottled, light gray very cherty silt loam. At a depth of more than 39 inches, it is brown and yellowish brown cherty silty clay and cherty silt loam.

The surface layer of the Frederick soils is brown cherty silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

The surface layer of the Lodi soils is dark grayish brown cherty silt loam about 7 inches thick. The subsoil is strong brown and yellowish red silty clay loam and clay 53 inches thick. The substratum is brownish yellow silt loam to a depth of 72 inches or more.

Included with these soils in mapping are small low areas of Timberville Variant soils along drainageways. They make up 5 percent of this unit. Also included are small wet areas along drainageways and a few small sinkholes. These make up about 5 percent of the unit.

Permeability is very slow in these Nixa soils and moderate in these Frederick and Lodi soils. Available water capacity is very low in the Nixa soils and moderate in the Frederick and Lodi soils. Surface runoff is slow to medium. The soils are low in natural fertility and organic matter content. The shrink-swell potential of the subsoil of these soils is mainly low to moderate but is high in the lower part of the Frederick soils. The root zone extends to a depth of about 16 inches in the Nixa soils and 50 inches in the Frederick and Lodi soils. The surface layer of these soils commonly is medium acid to strongly acid, and the subsoil is strongly acid to very strongly acid.

These soils are poorly suited to cultivated crops but are suited to pasture and hay. Much of the acreage is in pasture. Chert in the surface layer of these soils interferes with tillage and seeding, and the Nixa soils are very droughty during the growing season. The hazard of erosion is very severe in cultivated areas.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This unit is suited to trees, and a moderate acreage is wooded. Potential productivity is moderate to high. The soils are managed for hardwoods and pine.

The very slow permeability of the Nixa soils is the main limitation for community development.

The capability subclass is IVe.

51—Pits, gravel. This unit mainly is in areas along the South Fork of the Shenandoah River and its tributaries. The unit consists of areas from which gravel has been removed for construction purposes. The pits are 3 to 20 feet deep. They are irregular in shape and range from about 5 to 100 acres.

These areas generally are poorly suited to most types of farm and nonfarm uses, but onsite investigation is needed to determine the potentials and limitations of the unit for any proposed use.

The capability subclass is VIIIs.

52—Pits, sand. This unit mainly is in areas along the North River. The unit consists of areas from which sand has been removed for construction purposes. The pits are 5 to 15 feet deep and range from 5 to 20 acres.

These areas generally are poorly suited to most types of farm and nonfarm uses, but onsite investigation is needed to determine the potentials and limitations of the unit for any proposed use.

The capability subclass is VIIIs.

53—Pits and dumps, limestone. This unit consists of areas from which limestone and dolomite have been removed and of adjacent areas where the soil and other material from the excavations have been placed. The pits are about 10 to 50 feet deep, and some are flooded. The unit is irregular in shape and ranges from about 3 to 100 acres.

These areas generally are unsuited to most farm and nonfarm uses, but onsite investigation is needed to determine the potentials and limitations of the unit for any proposed use.

The capability subclass is VIIIs.

54A—Purdy silt loam, 0 to 2 percent slopes. This soil is nearly level and poorly drained. It is in depressions in concave areas at the heads of drainageways and along drainageways on terraces. The areas of this soil are oval or long and narrow and range from 5 to 30 acres.

Typically, the surface layer is grayish brown silt loam about 7 inches thick. The subsoil is mottled and is 29 inches thick. The upper part is grayish brown silty clay loam, the next part is gray clay loam, and the lower part is gray clay. The substratum is gray clay to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Buchanan, Millrock, and Monongahela soils that make up about 10 to 15 percent of this unit. They are generally on the edge of the unit. Also included are small areas of very poorly drained soils that make up about 5 percent of the unit.

The permeability of this Purdy soil is slow or very slow, and the available water capacity is moderate. Surface runoff is slow. The soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone is restricted by a seasonal high water table at or near the surface during winter and early in spring (fig. 6). The surface layer and subsoil of the soil are very strongly acid or strongly acid in unlimed areas.

The seasonal high water table makes undrained areas of this soil poorly suited to cultivated crops. The soil is moderately well suited to pasture and hay, but alfalfa is short lived because of seasonal wetness. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. Use of proper stocking rates,

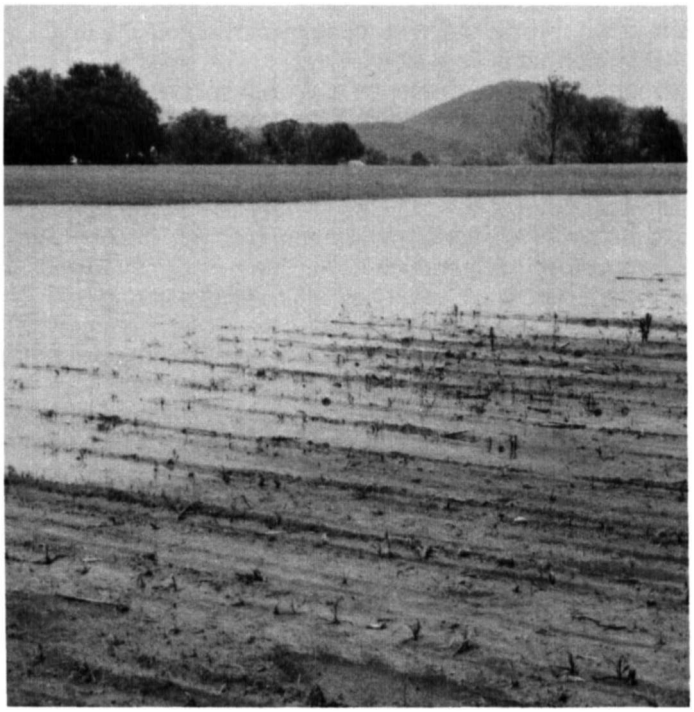


Figure 6.—Water on the surface of Purdy silt loam, 0 to 2 percent slopes.

pasture rotation, and deferred grazing are practices that help to maintain pastures and control erosion.

The soil is suited to trees, and a large acreage is wooded. Potential productivity is high. The soil is managed for pine and hardwoods.

The seasonal high water table during winter and spring is the main limitation of the soil for community development.

The capability subclass is IVw.

55C—Rock outcrop-Carbo complex, 0 to 20 percent slopes. This unit consists of areas of exposed limestone bedrock mixed with gently sloping to moderately steep, well drained soils. The unit is on side slopes of hills and ridges that commonly are marked by sinkholes. The areas of the unit are irregular in shape and range from a few acres to 500 acres. They are about 50 percent exposed bedrock, 40 percent Carbo soils, and 10 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Carbo soils is dark brown silt loam about 10 inches thick. The subsoil is strong brown and dark yellowish brown clay 22 inches thick. Limestone bedrock is at a depth of 32 inches.

Included with this unit in mapping are small areas of Endcav soils.

The subsoil of these Carbo soils has a high shrink-swell potential. The soil is slightly acid to mildly alkaline and has low organic matter content and medium natural fertility. The subsoil and substratum have slow permeability and low available water capacity. Runoff is medium to rapid.

A small acreage of this unit is wooded, but most areas are used for native pasture. The areas of exposed rock make the unit generally unsuitable for most other uses.

The capability subclass is VIIs.

56C—Rock outcrop-Frederick complex, 2 to 15 percent slopes. This unit consists of areas of exposed limestone bedrock mixed with gently sloping to sloping, well drained soils. The unit is on side slopes of hills and ridges that commonly are marked by sinkholes. The areas mainly are long and narrow and range from a few acres to several hundred acres. They are about 50 percent exposed rock, 30 percent Frederick soils, and 20 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Frederick soils is brown or dark grayish brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown light clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

Included with this unit in mapping are small areas of Lodi and Carbo soils.

These Frederick soils are slightly acid to strongly acid in unlimed areas. They have low organic matter content and low natural fertility. The subsoil and substratum have moderate permeability and moderate available water capacity. Surface runoff is medium to rapid.

A large acreage of this unit is wooded, but most areas are used for native pasture. The areas of exposed rock make the unit generally unsuitable for most other uses.

The capability subclass is VIIs.

56D—Rock outcrop-Frederick complex, 15 to 45 percent slopes. This unit consists of areas of exposed limestone bedrock mixed with moderately steep to steep, well drained soils. The unit is on side slopes of hills and ridges that commonly are marked by sinkholes. The areas mainly are long and narrow and range from a few acres to several hundred acres. They are about 50 percent exposed rock, 30 percent Frederick soils, and 20 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Frederick soils is brown or dark grayish brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 9 and 13 inches, it is strong brown light clay loam. At a depth of more than 13 inches, it is yellowish red and red clay.

These Frederick soils are slightly acid to strongly acid in unlimed areas. They have low organic matter content and low natural fertility. The subsoil and substratum have moderate permeability and moderate available water capacity. Surface runoff is rapid to very rapid.

Included with this unit in mapping are small areas of Carbo soils and some sinkholes.

Most areas of this unit are wooded. A small acreage is used for native pasture. Slope and the areas of exposed rock make the unit generally unsuitable for most other uses.

The capability subclass is VIIs.

57E—Rock outcrop-Laidig complex, 25 to 55 percent slopes. This unit consists of areas of exposed sandstone bedrock mixed with steep to very steep, well drained soils. The unit is on the side slopes and ridgetops of the Appalachian Mountains. Stones cover about 20 to 60 percent of the surface. The areas of this unit are long and narrow. They consist of 50 percent exposed bedrock, 40 percent Laidig soils, and 10 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Laidig soils is light brownish gray cobbly fine sandy loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 7 and 41 inches, it is mostly yellowish brown, friable cobbly clay loam. At a depth of more than 41 inches, it is yellowish brown, very firm cobbly fine sandy loam.

These Laidig soils are strongly acid to very strongly acid. The soil is low in natural fertility and organic matter content. Permeability is moderately slow, and available water capacity is low. Surface runoff is very rapid. A seasonal high water table is perched on the firm part of the subsoil in winter and spring.

Included with this unit in mapping are small intermingled areas of Drall soils, rubble, and shallow soils.

All areas of this unit are in hardwoods and mixed hardwood-pine forests. The slope, stones on the surface, and exposed rock make the unit generally unsuitable for most other uses.

The capability subclass is VIIs.

58B2—Sequoia silt loam, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on knolls and narrow ridgetops. The areas of this soil are circular or long and narrow and range from 5 to 50 acres. Some of the larger areas have shallow drainageways 100 to 400 feet apart.

Typically, the surface layer is yellowish brown silt loam about 9 inches thick. The subsoil is about 27 inches thick. It is yellowish red clay in the upper part and yellowish brown shaly clay loam in the lower part. The

substratum is brownish yellow, mottled very shaly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Berks soils that make up about 5 to 10 percent of this unit. Also included are small areas of soils with a surface layer of silty clay loam, spots of wet soils, and spots of exposed bedrock. These make up about 5 to 10 percent of the unit.

The permeability of this soil is moderately slow, and the available water capacity is moderate. Surface runoff is medium. The soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches but is somewhat restricted at a depth of about 36 inches by shale fragments. The surface layer and subsoil in unlimed areas commonly are very strongly acid to medium acid.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed mostly for pine.

The permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIe.

58C2—Sequoia silt loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on the side slopes of rolling to hilly uplands. The areas of this soil are long and narrow and range from 5 to 50 acres. Some of the larger areas have shallow drainageways 100 to 400 feet apart.

Typically, the surface layer is yellowish brown silt loam about 10 inches thick. The subsoil is about 26 inches thick. It is yellowish red clay in the upper part and yellowish brown shaly clay loam in the lower part. The substratum is brownish yellow, mottled very shaly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Berks soils that make up about 5 to 10 percent of this unit. Also included are small areas of soils with a surface layer of silty clay loam, spots of wet soils, and spots of exposed bedrock. These make up about 5 to 10 percent of the unit.

The permeability of this soil is moderately slow, and the available water capacity is moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches but is somewhat restricted at a depth of about 36 inches by shale fragments. The surface layer and subsoil in unlimed areas commonly are very strongly acid to medium acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soil is managed mostly for pine.

The permeability, shrink-swell potential, and slope of the soil are the main limitations for community development.

The capability subclass is IIIe.

59B2—Sequoia-Berks silt loams, 2 to 7 percent slops, eroded. This unit consists of gently sloping, well drained soils on narrow ridgetops. The areas of the unit are long and narrow and range from about 5 to 150 acres. They consist of about 55 percent Sequoia soils, 40 percent Berks soils, and 5 percent other soils. The Sequoia and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Sequoia soils is yellowish brown silt loam about 10 inches thick. The subsoil is about 26 inches thick. It is mostly yellowish red and yellowish brown clay and shaly clay loam. The substratum is brownish yellow, mottled very shaly clay loam to a depth of 60 inches or more.

The surface layer of the Berks soils is yellowish brown silt loam about 6 inches thick. The subsoil is yellowish brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Guernsey and Weikert soils. The Weikert soils are on the steeper parts of the slopes. The Guernsey soils are in small depressions and around the heads of drainageways. Also included are small areas of exposed shale bedrock and spots of wet soils.

The permeability of these Sequoia soils is moderately slow, and available water capacity is moderate. The permeability of the Berks soils is moderately rapid, and available water capacity is low. Surface runoff is medium. Both soils are low in natural fertility and organic matter content. The subsoil of the Sequoia soils has a moderate shrink-swell potential. The root zone of the Sequoia soils extends to a depth of about 60 inches but is somewhat restricted at a depth of 36 inches by shale fragments. The root zone of the Berks soils extends to bedrock commonly at a depth of 20 to 40 inches. The surface layer and subsoil in unlimed areas of these soils commonly are very strongly acid to medium acid.

This unit is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The hazard of erosion is moderate to severe in cultivated areas, and the Berks soils are droughty during the growing season. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

These soils are suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soils are managed mostly for pine.

The permeability and shrink-swell potential of Sequoia soils and the depth to bedrock in Berks soils are the main limitations for community development.

The capability subclass is IIe.

59C2—Sequoia-Berks silt loams, 7 to 15 percent slopes, eroded. This unit consists of sloping, well drained soils on upland side slopes crossed by shallow drainageways about 100 to 400 feet apart. The areas are long and narrow and range from about 5 to 75 acres. They consist of about 55 percent Sequoia soils, 40 percent Berks soils, and 5 percent other soils.

Typically, the surface layer of the Sequoia soils is yellowish brown silt loam about 10 inches thick. The subsoil is about 26 inches thick. It is mostly yellowish red and yellowish brown clay and shaly clay loam. The substratum is brownish yellow, mottled very shaly clay loam to a depth of 60 inches or more.

The surface layer of the Berks soils is yellowish brown silt loam about 6 inches thick. The subsoil is yellowish brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Weikert soils and small areas of exposed shale bedrock.

The permeability of these Sequoia soils is moderately slow, and available water capacity is moderate. The permeability of the Berks soils is moderately rapid, and available water capacity is low. Surface runoff is medium to rapid. Both soils are low in natural fertility and organic matter content. The subsoil of the Sequoia soils has a moderate shrink-swell potential. The root zone of the Sequoia soils extends to a depth of about 60 inches but is somewhat restricted at a depth of 36 inches by shale fragments. The root zone of the Berks soils extends to bedrock commonly at a depth 20 to 40 inches. The surface layer and subsoil in unlimed areas of these soils commonly are very strongly acid to medium acid.

This unit is suited to cultivated crops and moderately well suited to pasture and hay. Much of the acreage is farmed. The hazard of erosion is severe in cultivated areas, and the Berks soils are droughty during the growing season. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soils are suited to trees, and a moderate acreage is wooded. Potential productivity is moderately high. The soils are managed mostly for pine.

Slope, the permeability and shrink-swell potential of the Sequoia soils, and the depth to bedrock in the Berks soils are the main limitations for community development.

The capability subclass is IIIe.

59D2—Sequoia-Berks silt loams, 15 to 25 percent slopes, eroded. This unit consists of moderately steep, well drained soils on upland side slopes crossed by shallow drainageways about 100 to 300 feet apart. The areas are long and narrow and range from about 5 to 40 acres. They consist of about 60 percent Sequoia soils, 35 percent Berks soils, and 5 percent other soils. The Sequoia and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Sequoia soils is yellowish brown silt loam about 7 inches thick. The subsoil is about 24 inches thick. It is mostly yellowish red and yellowish brown clay and shaly clay loam. The substratum is brownish yellow, mottled very shaly clay loam to a depth of 60 inches or more.

The surface layer of the Berks soils is yellowish brown silt loam about 5 inches thick. The subsoil is yellowish brown silt loam or shaly silt loam 8 inches thick. The substratum is yellowish brown very shaly silt loam 18 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Weikert soils, exposed bedrock, and wet soils.

The permeability of these Sequoia soils is moderately slow, and available water capacity is moderate. The permeability of the Berks soils is moderately rapid, and available water capacity is low. Surface runoff is rapid. Both soils are low in natural fertility and organic matter content. The subsoil of the Sequoia soils has a moderate shrink-swell potential. The root zone of the Sequoia soils extends to a depth of about 60 inches but is somewhat restricted at a depth of 36 inches by shale fragments. The root zone of the Berks soils extends to bedrock commonly at a depth of 20 to 40 inches. The surface layer and subsoil in unlimed areas of these soils commonly are very strongly acid to medium acid.

This unit generally is poorly suited to cultivated crops and is moderately well suited to pasture. Some of the acreage is farmed. The hazard of erosion is very severe in cultivated areas, and the Berks soils are droughty during the growing season. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soils are suited to trees, but only a small acreage is wooded. Potential productivity is moderately high. The soils are managed mostly for pine.

Slope, the permeability of the Sequoia soils, and the depth to bedrock in the Berks soils are the main limitations for community development.

The capability subclass is IVe.

60C—Sequoia-Berks stony loams, 7 to 15 percent slopes. This unit consists of sloping, well drained soils on narrow mountain foot slopes crossed by drainageways about 100 to 300 feet apart. Stones cover about 3 percent of the surface. The areas of this unit are long and narrow and range from about 10 to 100 acres. They are about 50 percent Sequoia soils, 40 percent Berks soils, and 10 percent other soils. The Sequoia and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Sequoia soils is yellowish brown loam about 10 inches thick. The subsoil is about 26 inches thick. It is mostly yellowish red and yellowish brown clay and shaly clay loam. The substratum is brownish yellow, mottled very shaly clay loam to a depth of 60 inches or more.

The surface layer of Berks soils is yellowish brown loam about 6 inches thick. The subsoil is yellowish brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Laidig and Weikert soils and small areas of exposed bedrock and wet soils.

The permeability of these Sequoia soils is moderately slow, and available water capacity is moderate. The permeability of the Berks soils is moderately rapid, and available water capacity is low. Surface runoff is medium to rapid. Both soils are low in natural fertility and organic matter content. The subsoil of the Sequoia soils has a moderate shrink-swell potential. The root zone of the Sequoia soils extends to a depth of about 60 inches but is somewhat restricted at a depth of 36 inches by shale fragments. The root zone of the Berks soils extends to bedrock commonly at a depth of 20 to 40 inches. The surface layer and subsoil in unlimed areas of these soils commonly are very strongly acid to medium acid.

The stones on the surface, a very severe erosion hazard, and droughtiness during the growing season in the Berks soils make this unit poorly suited to cultivated crops. The soils are moderately well suited to pasture. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soils are suited to trees, and a moderate acreage is wooded. Potential productivity is moderately high. The soils are managed mostly for pine and hardwoods.

Slope, the permeability of the Sequoia soils, and the depth to bedrock in the Berks soils are the main limitations for community development.

The capability subclass is IIIe.

60D—Sequoia-Berks stony loams, 15 to 25 percent slopes. This unit consists of moderately steep, well drained soils on mountain foot slopes crossed by drainageways about 100 to 300 feet apart. Stones cover about 3 percent of the surface. The areas of this unit are long and narrow and range from about 5 to 100 acres. They are about 50 percent Sequoia soils, 45 percent Berks soils, and 5 percent other soils. The Sequoia and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Sequoia soils is yellowish brown loam about 10 inches thick. The subsoil is about 26 inches thick. It is mostly yellowish red and yellowish brown clay and shaly clay loam. The substratum is brownish yellow, mottled very shaly clay loam to a depth of 60 inches or more.

The surface layer of Berks soils is yellowish brown loam about 6 inches thick. The subsoil is yellowish

brown shaly silt loam 9 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Laidig and Weikert soils and small areas of exposed bedrock and wet soils.

The permeability of these Sequoia soils is moderately slow, and available water capacity is moderate. The permeability of the Berks soils is moderately rapid, and available water capacity is low. Surface runoff is rapid. Both soils are low in natural fertility and organic matter content. The subsoil of the Sequoia soils has a moderate shrink-swell potential. The root zone of the Sequoia soils extends to a depth of about 60 inches but is somewhat restricted at a depth of 36 inches by shale fragments. The root zone of the Berks soils extends to bedrock commonly at a depth of 20 to 40 inches. The surface layer and subsoil in unlimed areas of these soils commonly are very strongly acid to medium acid.

The stones on the surface, a very severe erosion hazard, and droughtiness during the growing season make this unit generally unsuited to cultivated crops. The soils are moderately well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soils are suited to trees, and a large acreage is wooded. Potential productivity is moderately high. The soils are managed for pine and hardwoods.

Slope, the permeability of the Sequoia soils, and the depth to bedrock in the Berks soils are the main limitations for community development.

The capability subclass is IVe.

61B—Shelocta Variant stony loam, 2 to 10 percent slopes. This soil is gently sloping and well drained. It is on lower mountain foot slopes and fans commonly crossed by shallow intermittent drainageways. Stones cover about 1 to 3 percent of the surface. The areas of this soil are irregular in shape and range from 3 to 40 acres.

Typically, the surface layer of this soil is dark brown stony loam about 7 inches thick. The subsoil is 47 inches thick. The upper 15 inches is light yellowish brown loam. The lower 32 inches is brownish yellow clay and clay loam. The substratum is mixed brownish yellow, red, and white very cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Buchanan, and Sequoia soils that make up about 15 percent of this unit. Also included are wet spots and areas where stones cover less than 1 percent or more than 3 percent of the surface. These make up about 5 percent of the unit.

The permeability of this Shelocta Variant soil is moderate to moderately slow. The available water capacity is moderate. Surface runoff is medium. The soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone typically extends to a depth of about 60 inches. The surface layer commonly is strongly acid to very strongly acid. The subsoil commonly is very strongly acid to medium acid.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is pastured. The stones on and in the soil damage tillage equipment and interfere with planting. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is very well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed for pine and hardwoods.

The permeability of this soil is the main limitation for community development.

The capability subclass is IIe.

62C—Shelocta Variant very stony loam, 5 to 15 percent slopes. This soil is sloping and well drained. It is on lower mountain foot slopes and fans commonly crossed by shallow intermittent drainageways. Stones cover about 3 to 15 percent of the surface. The areas of this soil are irregular in shape and range from about 5 to 100 acres.

Typically, the surface layer of this soil is dark brown very stony loam about 7 inches thick. The subsoil is 47 inches thick. The upper 15 inches is light yellowish brown loam. The lower 32 inches is brownish yellow clay and clay loam. The substratum is mixed brownish yellow, red, and white very cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Laidig, Buchanan, Sequoia, and Berks soils that make up about 20 percent of this unit. Also included are wet spots and areas where stones cover less than 3 percent or more than 15 percent of the surface. These make up about 5 percent of the unit.

The permeability of this Shelocta Variant soil is moderate to moderately slow. The available water capacity is moderate. Surface runoff is medium to rapid.

The soil is low in natural fertility and organic matter content. The subsoil has a moderate shrink-swell potential. The root zone typically extends to a depth of about 60 inches. The surface layer commonly is strongly acid to very strongly acid. The subsoil commonly is very strongly acid to medium acid.

The stones on the surface and a severe erosion hazard make this soil generally unsuited to cultivated crops and poorly suited to pasture and hay. The soil is well suited to trees, and most of the acreage is wooded. Potential productivity is high. The soil is managed for pines and hardwood.

Slope and the permeability of the soil are the main limitations for community development.

The capability subclass is VIs.

63B—Shenval loam, 2 to 7 percent slopes. This soil is gently sloping and well drained. It is on broad terraces along the larger streams. The areas of this soil commonly are long and narrow and range from 3 to 50 acres. A few small sinkholes are in some areas.

Typically, the surface layer is dark brown loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 7 and 35 inches, it is yellowish red clay loam and clay. At a depth of more than 35 inches, it is yellowish red clay.

Included with this soil in mapping are small intermingled areas of Frederick, Allegheny, and Monongahela soils that make up about 20 percent of this unit. The Frederick soils are near the adjacent uplands; the Allegheny and Monongahela are on the terraces. Also included are small areas of soils with a surface layer of cobbly loam that make up about 5 percent of the unit.

The permeability of this Shenval soil is moderate, and the available water capacity is moderate. Surface runoff is medium. The soil is medium in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is suited to cultivated crops and to pasture and hay. Most areas are farmed. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

The permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIe.

63C2—Shenval loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on broad terraces along the larger streams. The areas of this soil commonly are long and narrow and range from 3 to 50 acres. A few small sinkholes are in some areas.

Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 5 and 35 inches, it is yellowish red clay loam and clay. At a depth of more than 35 inches, it is yellowish red clay.

Included with this soil in mapping are small intermingled areas of Frederick, Allegheny, and Monongahela soils that make up about 20 percent of this unit. The Monongahela soils are in more nearly level or concave areas. The Frederick and Allegheny soils are on the terraces. Also included are small areas of soils with a surface layer of cobbly loam that make up about 5 percent of the unit.

The permeability of this Shenval soil is moderate, and the available water capacity is moderate. Surface runoff is medium to rapid. The soil is medium in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

The permeability, shrink-swell potential, and slope of the soil are the main limitations for community development.

The capability subclass is IIIe.

63D2—Shenval loam, 15 to 25 percent slopes, eroded. This soil is moderately steep and well drained. It

is on breaks between terraces along the larger streams. The areas of this soil commonly are long and narrow and range from 3 to 30 acres. A few small sinkholes are in some areas.

Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil extends to a depth of 60 inches or more. Between depths of 5 and 35 inches, it is yellowish red clay loam and clay. At a depth of more than 35 inches, it is yellowish red clay.

Included with this soil in mapping are small intermingled areas of Frederick and Allegheny soils that make up about 15 percent of this unit. Also included are small areas of soils with a surface layer of cobbly loam that make up about 15 percent of the unit.

The permeability of this Shenval soil is moderate, and the available water capacity is moderate. Surface runoff is rapid. The soil is medium in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

A very severe hazard of erosion makes this soil poorly suited to cultivated crops. The soil is moderately well suited to pasture and hay. Most of the acreage is in pasture. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, but only a small acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

Slope is the main limitation of the soil for community development.

The capability subclass is IVe.

64C—Sherando cobbly sandy loam, 7 to 15 percent slopes. This soil is sloping and well drained to somewhat excessively drained. It is on fans and foot slopes in mountainous uplands. The areas of this soil are irregular in shape and range from about 5 to 50 acres. Some of the larger areas have shallow drainageways about 100 to 300 feet apart.

Typically, the surface layer is yellowish brown cobbly sandy loam about 12 inches thick. The subsoil is strong brown very cobbly sandy loam 21 inches thick. The substratum is brownish yellow very cobbly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Craigsville and Laidig soils that make up about 10 to 15 percent of the unit. The Craigsville soils are close to flood plains and low terraces. The Laidig soils are commonly on higher areas of the unit.

The permeability of this Sherando soil is moderately rapid to rapid. Surface runoff is medium to rapid. The soil is low in natural fertility and organic matter content. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are very strongly acid to medium acid.

A severe erosion hazard and droughtiness during the growing season make this soil poorly suited to cultivated crops. Cobblestones in the soil interfere with tillage and damage farm equipment. The soil is moderately well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderately high. The soil is managed for pine and hardwoods.

Slope is the main limitation of the soil for community development.

The capability subclass is IVe.

64D—Sherando cobbly sandy loam, 15 to 35 percent slopes. This soil is moderately steep to steep and well drained to somewhat excessively drained. It is on terrace breaks between mountain slopes and terraces. The areas of this soil commonly are long and narrow and range from about 5 to 30 acres. Some of the larger areas have shallow drainageways about 100 to 300 feet apart.

Typically, the surface layer is yellowish brown cobbly sandy loam about 12 inches thick. The subsoil is strong brown very cobbly sandy loam 21 inches thick. The substratum is brownish yellow very cobbly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Craigsville and Laidig soils that make up about 10 to 15 percent of the unit. The Craigsville soils are close to flood plains and low terraces. The Laidig soils are commonly on higher areas of the unit.

The permeability of this Sherando soil is moderately rapid to rapid. Surface runoff is rapid. The soil is low in natural fertility and organic matter content. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are very strongly acid to medium acid.

A very severe erosion hazard and droughtiness during the growing season make this soil unsuitable for cultivated crops and poorly suited to pasture. The cobblestones in the soil interfere with tillage. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is suited to trees, and most of the acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Slope is the main limitation of this soil for community development.

The capability subclass is VIs.

65B2—Swimley silty clay loam, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on ridgetops, hills, and side slopes. The areas of this soil are rectangular and range from 3 to 40 acres. Many are crossed by shallow drainageways.

Typically, the surface layer is dark brown silty clay loam about 7 inches thick. The subsoil is dark reddish brown clay to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Frederick, Lodi, Endcav, and Timberville Variant soils that make up about 15 percent of this unit. The Timberville Variant soils are in concave areas and along drainageways, and the other soils are scattered throughout the unit. Also included are wet spots, spots of severely eroded soils, small areas of exposed bedrock, and sinkholes. These make up about 5 percent of the unit.

The permeability of this Swimley soil is moderate, and the available water capacity is moderate. Surface runoff is medium. The soil is medium in natural fertility and low in organic matter content. The subsoil has a moderate shrink-swell potential in the upper part and a high shrink-swell potential in the lower part. The root zone extends to a depth of at least 60 inches. The soil is strongly acid to neutral.

This soil is well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

The low strength and shrink-swell potential of the subsoil are the main limitations of the soil for community development.

The capability subclass is IIe.

65C2—Swimley silty clay loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on knolls, ridgetops, and side slopes. The areas of this soil are rectangular and range from 3 to 50 acres. Many have shallow drainageways.

Typically, the surface layer is dark brown silty clay loam about 7 inches thick. The subsoil is dark reddish brown clay to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Frederick, Lodi, Endcav, and Timberville Variant soils that make up about 20 percent of this unit. Also included are wet spots, spots of severely eroded soils, small areas of exposed bedrock, and sinkholes. These make up about 5 percent of the unit.

The permeability of this Swimley soil is moderate, and the available water capacity is moderate. Surface runoff is medium. The soil is medium in natural fertility and low in organic matter content. The subsoil has a moderate shrink-swell potential in the upper part and a high shrink-swell potential in the lower part. The root zone extends to a depth of at least 60 inches. The soil is strongly acid to neutral.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Slope and the low strength and shrink-swell potential of the subsoil are the main limitations of the soil for community development.

The capability subclass is IIIe.

66D—Sylco flaggy silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. It

is on hilly, western foot slopes of the Blue Ridge Mountains. The areas of this soil are irregular in shape and range from about 10 to 100 acres.

Typically, the surface layer is yellowish brown flaggy silt loam about 8 inches thick. The subsoil is yellowish brown flaggy silt loam 12 inches thick. The substratum is yellowish brown very channery silt loam 14 inches thick. Phyllite bedrock is at a depth of 34 inches.

Included with this soil in mapping are small areas of Drall, Laidig, Fauquier, and Hawksbill soils that make up about 15 percent of this unit. Also included are spots of stony or very stony soils and exposed bedrock. These make up about 5 percent of the unit.

The permeability of this Sylco soil is moderate, and the available water capacity is low. Surface runoff is rapid. The soil is low in natural fertility and organic matter content. Root growth typically is restricted at a depth of about 24 inches by stones in the soil. The surface layer and subsoil in unlimed areas are commonly very strongly acid.

Slope and droughtiness during the growing season make this soil poorly suited to farming. Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderate. The soil is managed for pine and hardwoods.

Slope and the depth to bedrock are the main limitations of the soil for community development.

The capability subclass is VIe.

66E—Sylco flaggy silt loam, 25 to 45 percent slopes. This soil is steep and well drained. It is on the western foot slopes of the Blue Ridge Mountains. The areas of this soil are irregular in shape and range from about 10 to 300 acres.

Typically, the surface layer is yellowish brown flaggy silt loam about 8 inches thick. The subsoil is yellowish brown flaggy silt loam about 12 inches thick. The substratum is yellowish brown very channery silt loam 14 inches thick. Phyllite bedrock is at a depth of 34 inches.

Included with this soil in mapping are small areas of Drall, Laidig, and Fauquier soils that make up about 15 percent of this unit. Also included are spots of stony or very stony soils and exposed bedrock. These make up about 5 percent of the unit.

The permeability of this Sylco soil is moderate, and the available water capacity is low. Surface runoff is very rapid. The soil is low in natural fertility and organic matter content. Root growth typically is restricted at a depth of about 24 inches by stones in the soil. The surface layer and subsoil in unlimed areas commonly are very strongly acid.

Slope and droughtiness during the growing season make this soil generally unsuitable for farming. The soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderate. The soil is managed for pine and hardwoods.

Slope and the depth to bedrock are the main limitations of the soil for community development.

The capability subclass is VIIe.

67F—Sylco very stony silt loam, 25 to 60 percent slopes. This soil is steep to very steep and well drained. It is on the western slopes of the Blue Ridge Mountains. The areas of this soil are irregular in shape and range from about 100 to 2,000 acres. Stones and boulders cover 3 to 15 percent of the surface.

Typically, the surface layer is yellowish brown flaggy silt loam about 8 inches thick. The subsoil is yellowish brown flaggy silt loam 12 inches thick. The substratum is yellowish brown very channery silt loam 14 inches thick. Bedrock is at a depth of 34 inches.

Included with this soil in mapping are small areas of Drall, Laidig, Fauquier, and Myersville soils that make up about 15 percent of this unit. Also included are spots of stony or very flaggy soils and exposed bedrock. These make about 5 percent of the unit.

The permeability of this Sylco soil is moderate, and the available water capacity is low. Surface runoff is very rapid. The soil is low in natural fertility and organic matter content. Root growth typically is restricted at a depth of about 24 inches by stones in the soil. The surface layer and subsoil in unlimed areas commonly are very strongly acid.

Slope and the stones on the surface make this soil generally unsuitable for farming. The soil is suited to trees, and most of the acreage is wooded. Potential productivity is moderate. The soil is managed for pine and hardwoods.

Slope and the depth to bedrock are the main limitations of the soil for community development.

The capability subclass is VIIs.

68B—Timberville Variant silt loam, 0 to 7 percent slopes. This soil is gently sloping and well drained. It is in upland depressions, on alluvial fans, and on small, narrow flood plains. The areas of this soil are irregular in shape and range from 3 to 20 acres.

Typically, the surface layer is yellowish brown silt loam about 8 inches thick. The subsoil is yellowish brown silt loam 28 inches thick. The next layer is multicolored and extends to a depth of 72 inches or more. It is loam, cherty loam, very cherty loam, and clay.

Included with this soil in mapping are small intermingled areas of Frederick, Lodi, and Nixa soils that make up about 5 to 10 percent of the unit. They mainly are on the edges of the unit. Also included are spots of

cherty soils and soils with a surface layer of sandy loam. These make up about 5 percent of the unit.

The permeability of this Timberville Variant soil is moderate, and the available water capacity is moderate. Surface runoff is slow to medium. The soil is medium in natural fertility and low in organic matter content. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are medium acid to very strongly acid. This soil is subject to very brief flooding during periods of high rainfall.

This soil is suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Flooding is the major hazard for crops. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, but only a small acreage is wooded. Potential productivity is high. The soil is managed for pine and hardwoods.

Flooding is the main limitation of this soil for community development.

The capability subclass is IIw.

69A—Tioga fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and well drained. It is on flood plains bordering the major streams and rivers. The areas of this soil commonly are long and narrow and range from 3 to 100 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 12 inches thick. The subsoil is 18 inches thick. The upper 12 inches of the subsoil is brown fine sandy loam, and the lower 6 inches is very dark grayish brown loam. The substratum consists of stratified layers of brown, mottled loam and loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Buckton, Chavies, and Millrock soils. Also included are small cobbly or gravelly areas and areas where the slope range is more than 2 percent. Included areas make up 10 to 25 percent of this unit.

The permeability of this Tioga soil is moderate, and the available water capacity is low. Surface runoff is slow. The soil is medium in natural fertility and low in organic matter content. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are medium acid to slightly acid. This soil is sometimes flooded for brief periods during periods of heavy rainfall.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Flooding is the major hazard for crops. Minimum tillage, the use of cover crops and grasses and legumes in the cropping system, and keeping crop residue on or in the surface layer help to improve tilth and prevent scouring.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, but only a very small acreage is wooded. Potential productivity is moderately high. The soil is managed for hardwoods and pine.

Flooding is the main limitation of the soil for community development.

The capability subclass is IIw.

70A—Typic Udorthents, nearly level. These soils are deep and well drained. They are on flood plains adjacent to small streams.

These soils are very strongly acid or strongly acid in unlimed areas. They have low organic matter content and low natural fertility. The soils have rapid permeability and low available water capacity. Runoff is slow, and the soils are occasionally flooded.

Most areas of these soils are in pasture or woodland. A high content of cobblestones in the soil, droughtiness, and flooding limit the soils for most other types of farm or nonfarm use.

The capability subclass is VIs.

71B2—Unison fine sandy loam, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on broad terraces along large streams. The areas of this soil commonly are long and narrow and range from 5 to 50 acres. A few small sinkholes are in some areas.

Typically, the surface layer is yellowish brown fine sandy loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It mostly is yellowish red clay and red cobbly clay.

Included with this soil in mapping are small intermingled areas of Buchanan, Laidig, and Monongahela soils that make up about 10 to 15 percent of this unit. Also included are small areas of soils with a surface layer of cobbly fine sandy loam that make up about 5 percent of the unit.

The permeability of this Unison soil is moderate, and the available water capacity is moderate. Surface runoff is medium. The soil is low in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer

and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is well suited to trees, and a moderate acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

The permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIe.

71C2—Unison fine sandy loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on broad terraces along large streams. The areas of this soil commonly are long and narrow and range from 5 to 40 acres. A few small sinkholes are in some areas.

Typically, the surface layer is yellowish brown fine sandy loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It mostly is yellowish red clay and red cobbly clay.

Included with this soil in mapping are small intermingled areas of Buchanan, Laidig, and Monongahela soils that make up about 10 to 15 percent of this unit. Also included are small areas of soils with a surface layer of cobbly fine sandy loam that make up about 5 percent of the unit.

The permeability of this Unison soil is moderate, and the available water capacity is moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. The hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, and a moderate acreage is wooded. Potential productivity is high. The soil is managed for pine and hardwoods.

Slope and the permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IIIe.

72B2—Unison cobbly fine sandy loam, 2 to 7 percent slopes, eroded. This soil is gently sloping and well drained. It is on broad terraces along large streams. The areas of this soil commonly are long and narrow and range from 5 to 100 acres. They are crossed by shallow drainageways 200 to 500 feet apart, and a few small sinkholes are in some areas.

Typically, the surface layer is yellowish brown cobbly fine sandy loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It mostly is yellowish red clay and red cobbly clay.

Included with this soil in mapping are small intermingled areas of Buchanan, Laidig, and Monongahela soils that make up about 10 to 15 percent of this unit. Also included are small areas of eroded soils with a surface layer of cobbly clay loam. These make up about 5 percent of the unit.

The permeability of this Unison soil is moderate, and the available water capacity is moderate. Surface runoff is medium. The soil is low in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Cobblestones in the surface layer damage equipment and interfere with field operations, and the hazard of erosion is moderate in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, and a moderate acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

The shrink-swell potential and permeability of the soil are the main limitations for community development.

The capability subclass is IIIe.

72C2—Unison cobbly fine sandy loam, 7 to 15 percent slopes, eroded. This soil is sloping and well drained. It is on broad terraces along large streams. The areas of this soil commonly are long and narrow and range from 5 to 50 acres. They are crossed by shallow drainageways 100 to 400 feet apart, and a few small sinkholes are in some areas.

Typically, the surface layer is yellowish brown cobbly fine sandy loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It mostly is yellowish red clay and red cobbly clay.

Included with this soil in mapping are small intermingled areas of Buchanan, Laidig, and Monongahela soils that make up about 10 to 15 percent of this unit. Also included are small areas of severely eroded soils with a surface layer of cobbly clay loam. These make up about 5 percent of the unit.

The permeability of this Unison soil is moderate, and the available water capacity is moderate. Surface runoff is medium to rapid. The soil is low in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is moderately well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Cobblestones in the surface layer damage tillage equipment and interfere with field operations, and the hazard of erosion is severe in cultivated areas. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, and a moderate acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

Slope and the permeability and shrink-swell potential of the soil are the main limitations for community development.

The capability subclass is IVe.

72D2—Unison cobbly fine sandy loam, 15 to 30 percent slopes, eroded. This soil is moderately steep and well drained. It is on breaks between terraces along large streams. The areas of this soil commonly are long and narrow and range from 5 to 30 acres. They are crossed by drainageways 100 to 300 feet apart, and a few small sinkholes are in some areas.

Typically, the surface layer is yellowish brown cobbly fine sandy loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It mostly is yellowish red clay and red cobbly clay.

Included with this soil in mapping are small intermingled areas of Laidig soils, mainly on the upper slopes, that make up about 10 percent of this unit. Also included are small areas of severely eroded soils with a surface layer of cobbly clay loam. These make up about 5 percent of the unit.

The permeability of this Unison soil is moderate, and the available water capacity is moderate. Surface runoff is rapid. The soil is low in natural fertility and moderately low in organic matter content. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil in unlimed areas commonly are strongly acid to medium acid.

This soil is poorly suited to cultivated crops and moderately well suited to pasture and hay. A moderate acreage is farmed. Cobblestones in the surface layer damage tillage equipment and interfere with field operations, and the hazard of erosion is very severe if the soil is cultivated. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas. Crop residue kept on or in the surface layer helps to improve tilth.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

The soil is well suited to trees, and a moderate acreage is wooded. Potential productivity is very high. The soil is managed for pine and hardwoods.

Slope is the main limitation of the soil for community development.

The capability subclass is VIe.

73—Urban land. This unit consists of soils that have been covered by streets, parking lots, and buildings. These areas mostly are in and near towns and cities.

The unit is not assigned to a capability subclass.

74E2—Weikert-Berks shaly silt loam, 25 to 45 percent slopes, eroded. This unit consists of steep, well drained soils on the side slopes of hills and ridges. The areas of this unit are long and winding and range from 5 to 50 acres. Many of the larger areas have shallow drainageways 50 to 100 feet apart. The unit is about 45 percent Weikert soils, 45 percent Berks soils, and 10

percent other soils. The Weikert and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Weikert soils is yellowish brown shaly silt loam about 7 inches thick. The subsoil is pale brown very shaly silt loam 7 inches thick. Shale is at a depth of 14 inches, and hard shale is at a depth of 19 inches.

The surface layer of the Berks soils is yellowish brown shaly silt loam about 5 inches thick. The subsoil is yellowish brown shaly silt loam 10 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Laidig and Sequoia soils that make up about 5 percent of this unit. Also included are small wet areas and extremely stony areas along the drainageways and small areas of exposed bedrock on the tops and side slopes of ridges. These make up about 5 percent of the unit.

Permeability is moderately rapid in the Weikert soils and moderate to moderately rapid in the Berks soils. The available water capacity of both soils is very low, and surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The root zone extends to a depth of about 14 inches in the Weikert soils and 20 inches in the Berks soils. The surface layer and subsoil in unlimed areas of these soils commonly are strongly acid or very strongly acid. Bedrock is at a depth of 12 to 20 inches in the Weikert soils and 20 to 40 inches in the Berks soils.

Slope and droughtiness during the growing season make this unit poorly suited to farming. The soils are suited to trees, and a large acreage is wooded. Potential productivity is low to moderate. The soils are managed mostly for pine and hardwoods.

Slope and the depth to bedrock are the main limitations of the unit for community development.

The capability subclass is VIIe.

74F2—Weikert-Berks shaly silt loams, 45 to 70 percent slopes, eroded. This unit consists of steep, well drained soils on the side slopes of hills and ridges. The areas of this unit are long and winding and range from 5 to 500 acres. Many of the larger areas have shallow drainageways 50 to 200 feet apart. The unit is about 50 percent Weikert soils, 45 percent Berks soils, and 5 percent other soils. The Weikert and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Weikert soils is yellowish brown shaly silt loam about 4 inches thick. The subsoil is pale brown very shaly silt loam 10 inches thick. Hard shale bedrock is at a depth of 14 inches.

The surface layer of the Berks soils is yellowish brown shaly silt loam about 5 inches thick. The subsoil is yellowish brown shaly silt loam 10 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small areas of Laidig soils and stony areas along the drainageways.

Permeability is moderately rapid in the Weikert soils and moderate to moderately rapid in the Berks soils. The available water capacity of both soils is very low, and surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The root zone extends to a depth of about 14 inches in the Weikert soils and 20 inches in the Berks soils. The surface layer and subsoil in unlimed areas of these soils commonly are strongly acid or very strongly acid. Bedrock is at a depth of 12 to 20 inches in the Weikert soils and 20 to 40 inches in the Berks soils.

Slope makes these soils generally unsuitable for farming. The soils are poorly suited to trees, but a large acreage is wooded. Potential productivity is low to moderate. The soil is managed mostly for pine and hardwoods. Slope limits the use of harvesting equipment.

Slope and the depth to bedrock are the main limitations of the unit for community development.

The capability subclass is VIIe.

75E2—Weikert-Berks very stony silt loams, 25 to 45 percent slopes, eroded. This unit consists of steep, well drained soils on the side slopes of mountains. The areas of this unit are long and winding and range from about 5 to 500 acres. Stones cover about 3 to 15 percent of the surface, and many of the larger areas have shallow drainageways 100 to 300 feet apart. The unit is about 40 percent Weikert soils, 40 percent Berks soils, and 20 percent other soils. The Weikert and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Weikert soils is yellowish brown very shaly loam about 5 inches thick. The subsoil is pale brown very shaly silt loam 9 inches thick. Shale bedrock is at a depth of 14 inches.

The surface layer of the Berks soils is yellowish brown shaly silt loam about 5 inches thick. The subsoil is yellowish brown shaly silt loam 10 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Dekalb and Calvin soils that make up about 5 percent of this unit. Also included are small wet areas and extremely stony areas along drainageways and small areas of exposed bedrock on the tops and side slopes of ridges. These make up about 5 percent of the unit.

Permeability is moderately rapid in the Weikert soils and moderate to moderately rapid in the Berks soils. The available water capacity of both soils is very low, and surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The root zone extends to a depth of about 14 inches in the Weikert

soils and 20 inches in the Berks soils. The surface layer and subsoil in unlimed areas of these soils commonly are strongly acid or very strongly acid. Bedrock is at a depth of 12 to 20 inches in the Weikert soils and 20 to 40 inches in the Berks soils.

Slope and the stones on the surface make these soils generally unsuitable for farming. The soils are suited to trees, and a large acreage is wooded. Potential productivity is low to moderate. The soils are managed mostly for pine and hardwoods.

Slope and the depth to bedrock are the main limitations of the unit for community development.

The capability subclass is VIIs.

75F2—Weikert-Berks very stony silt loams, 45 to 70 percent slopes, eroded. This unit consists of very steep, well drained soils on the side slopes of mountains. The areas of this unit are long and winding and range from about 5 to 1,000 acres. Stones cover about 3 to 15 percent of the surface, and many of the larger areas have shallow drainageways 50 to 200 feet apart. The unit is about 50 percent Weikert soils, 40 percent Berks soils, and 10 percent other soils. The Weikert and Berks soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Weikert soils is yellowish brown very shaly loam about 5 inches thick. The subsoil is pale brown very shaly silt loam 9 inches thick. Shale bedrock is at a depth of 14 inches.

The surface layer of the Berks soils is yellowish brown shaly silt loam about 5 inches thick. The subsoil is yellowish brown shaly silt loam 10 inches thick. The substratum is yellowish brown very shaly silt loam 16 inches thick. Shale bedrock is at a depth of 31 inches.

Included with these soils in mapping are small intermingled areas of Dekalb and Calvin soils that make up about 5 percent of this unit. Also included are small wet areas and extremely stony areas along drainageways and small areas of exposed bedrock on the tops and side slopes of ridges. These make up about 5 percent of the unit.

Permeability is moderately rapid in the Weikert soils and moderate to moderately rapid in the Berks soils. The available water capacity of both soils is very low, and surface runoff is very rapid. The soils are low in natural fertility and organic matter content. The root zone extends to a depth of about 14 inches in the Weikert soils and 20 inches in the Berks soils. The surface layer and subsoil in unlimed areas of these soils commonly are strongly acid or very strongly acid. Bedrock is at a depth of 12 to 20 inches in the Weikert soils and 20 to 40 inches in the Berks soils.

Slope and the stones on the surface make these soils generally unsuitable for farming. The soils are suited to trees, and a large acreage is wooded. Potential productivity is low to moderate. The soils are managed mostly for pine and hardwoods.

Slope and the depth to bedrock are the main limitations of the unit for community development.

The capability subclass is VIIs.

76A—Wheeling fine sandy loam, 0 to 4 percent slopes. This soil is nearly level to gently sloping and is well drained. It is on broad, low terraces adjacent to flood plains of the larger streams and rivers. The areas of this soil are irregular in shape and range from 3 to 50 acres.

Typically, the surface layer is dark yellowish brown fine sandy loam about 9 inches thick. The subsoil is brown sandy clay loam and clay loam 55 inches thick. The substratum is brown sandy loam to a depth of 72 inches or more.

Included with this soil in mapping are small intermingled areas of Tioga and Chavies soils that make up about 10 percent of this unit. A few small gravelly areas and areas of soils containing a firm layer in the subsoil are also included. These make up about 3 percent of the unit.

The permeability of this Wheeling soil is moderate in the subsoil and moderately rapid in the substratum. The available water capacity is moderate. Surface runoff is slow. The soil is medium in natural fertility and moderately low in organic matter content. The root zone extends to a depth of about 60 inches. In unlimed areas the surface layer is slightly acid to neutral and the subsoil is medium acid to neutral. This soil is subject to flooding during periods of high rainfall.

This soil is suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Flooding is a hazard to crops in some years. Minimum tillage and the use of cover crops and grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion in cultivated areas.

Establishing and maintaining a mixture of grasses and legumes and the prevention of overgrazing are the main pasture management concerns. The use of proper stocking rates, pasture rotation, and deferred grazing are practices that help to control erosion. Grazing during periods of seasonal wetness cuts and compacts the surface layer and increases erosion.

This soil is well suited to trees, but only a very small acreage is wooded. Potential productivity is high. The soil is managed for hardwoods and pine.

Flooding is the main limitation for community development.

The capability class is I.

prime farmland

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. The supply of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the use of our Nation's prime farmland with wisdom and foresight.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland may now be in crops, pasture, woodland, or other land, but not urban and built-up land or water areas. It must either be used for producing food or fiber or be available for these uses.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. It also has favorable temperature and growing season and acceptable levels of acidity or alkalinity. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not flooded during the growing season. The slope range mainly is 0 to 6 percent. For more detailed information on the criteria for prime farmland consult the local staff of the Soil Conservation Service.

A recent trend in land use in some parts of the survey area has been toward the loss of some prime farmlands 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 difficult to cultivate and usually are less productive.

About 45,833 acres, or nearly 8 percent of Rockingham County, meets the soil requirements for prime farmland. The largest areas of prime farmland are in the Great Limestone Valley. Soil map units that make up prime farmland in Rockingham County are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in the table 4. The location is shown on the detailed soil maps in the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units."

Soils that have a limitation of flooding may qualify for prime farmland if that limitation is overcome. In the following list, the measure needed to overcome the limitation is shown in parentheses after the map unit name. Onsite evaluation is necessary to see if the limitation has been overcome by corrective measures.

The map units that meet the soil requirements for prime farmland are:

1B	Allegheny fine sandy loam, 1 to 7 percent slopes
10A	Buckton loam, 0 to 4 percent slopes (when protected from flooding)
13A	Chavies fine sandy loam, 0 to 4 percent slopes (when protected from flooding)
18B	Cotaco fine sandy loam, 0 to 7 percent slopes
23B2	Edom silty clay loam, 2 to 7 percent slopes, eroded
29B2	Frederick and Lodi silt loams, 2 to 7 percent slopes, eroded
31B2	Frederick and Lodi cherty silt loams, 2 to 7 percent slopes, eroded
35B	Guernsey silt loam, 2 to 7 percent slopes
39B	Laidig gravelly fine sandy loam, 2 to 7 percent slopes
58B2	Sequoia silt loam, 2 to 7 percent slopes, eroded
59B2	Sequoia-Berks silt loams, 2 to 7 percent slopes, eroded
63B	Shenval loam, 2 to 7 percent slopes
65B2	Swimley silty clay loam, 2 to 7 percent slopes, eroded
68B	Timberville Variant silt loam, 0 to 7 percent slopes
69A	Tioga fine sandy loam, 0 to 3 percent slopes (when protected from flooding)
71B2	Unison fine sandy loam, 2 to 7 percent slopes, eroded
76A	Wheeling fine sandy loam, 0 to 4 percent slopes

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior 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 recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

crops and pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Farmland covers about 25 percent, or 138,800 acres, of the land area of Rockingham County. A little over one-half of this acreage is harvested cropland, and the rest—including about 40,000 acres of farm woodland—is used for pasture.

Hay and grass silage are the dominant crops, covering about 35,000 acres. Corn is the next most dominant, totaling 31,600 acres; about half of this acreage is used for feed and grain and half for silage. Wheat is grown on about 3,800 acres, oats on 300 acres, and sorghums on 100 acres.

The chief fruit crop in the county is apples, covering about 2,000 acres. Peach orchards use about 375 acres.

A very small acreage, mainly less than 25 acres, is used for soybeans, Irish potatoes, vegetables, and sweet corn.

Erosion is the major hazard on about 70 percent of the cropland and pasture in Rockingham County, mainly where the slope is more than 2 percent.

Erosion is harmful for two main reasons. (1) If the surface layer is lost through erosion, most of the available nutrients and organic matter are lost, thereby reducing the rate of water infiltration, the available water capacity, and the general tilth of the soil. Erosion of the surface layer is especially damaging to soils that have a firm underlying layer, such as Buchanan soils, and to soils that have bedrock near the surface, such as Chilhowie soils. Erosion makes seedbed preparation and tilling especially difficult on sloping areas of Lodi and Edom soils, for instance, because the surface layer has been removed, exposing the clayey underlying layers. (2) Soil erosion commonly causes sedimentation of streams, reducing the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps plant cover on the soil for extended periods reduces soil erosion and preserves the productive capacity of the soils. On livestock farms, which require pasture and hay, the legume and grass

forage crops in the cropping system reduce erosion on sloping land, provide nitrogen, and improve tilth.

Minimum tillage and leaving crop residue on the surface of the soil help to increase infiltration and reduce runoff and erosion. These practices can be used on most soils in the survey area but are more difficult to use successfully on the eroded soils and on the soils that have a surface layer of silty clay, such as Chilhowie soils. No-till farming for corn, which is common, is effective for reducing erosion on sloping land and is suitable for most soils in the survey area but is difficult to use on the soils with a clayey surface layer.

Contouring and contour stripcropping are widespread erosion control practices in the survey area. They are especially suited to soils with smooth, uniform slopes, including most areas of the sloping Allegheny, Burketown, Lodi, Cotaco, Edom, Endcav, Frederick, Sequoia, Shenval, and Unison soils.

Drainage is the major management need on about 10 percent of the acreage used for crops and pasture in the survey area. Such soils as poorly drained and somewhat poorly drained Fluvaquents and poorly drained Purdy soils are naturally so wet, however, that the production of crops common to the area is generally not practical. Unless artificially drained, the somewhat poorly drained soils, such as the Buchanan soils, are so wet that crops are damaged during most years.

The design of surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of the poorly drained soils intensively used for row cropping. Drains have to be more closely spaced in soils with slow permeability than the more permeable soils. Finding adequate outlets for tile drainage systems is difficult in many areas of Fluvaquents and Purdy soils.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

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

The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Norman Wilson, staff forester, Soil Conservation Service, assisted in the preparation of this section.

About 57 percent, or 312,794 acres, of the land area of Rockingham County is in forests. According to the 1977 Forest Statistics, 259,963 acres is in commercial forests. Of this, 46 percent is in the George Washington National Forest.

The commercial forest consists of three major forest types: oak-hickory (208,060 acres), oak-pine (42,940 acres), and white pine (4,020 acres). The minor forest types, covering about 4,943 acres, mainly consist of eastern redcedar, Table-Mountain pine, elm, ash, and cottonwood.

Table 6 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, t, d, c, s, f, and r.

In table 6, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in 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.

Trees to plant are those that are suited to the soils and to commercial wood production.

recreation

The soils of the survey area are rated in table 7 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not

considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

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, horseback riding, and bicycling 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.

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 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, 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 flood hazard. 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, the 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, seeds, and cones. 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.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, 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, shore birds, muskrat, mink, and beaver.

engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and

topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

building site development

Table 9 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 the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils.

Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 10 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 due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and 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 needs to be considered.

The ratings in table 10 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 type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 11, 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 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 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

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.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. 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 a soil contains particles coarser than sand, 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, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments more than 3 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 oven-dry 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 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 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 14, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

soil and water features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

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 and water in swamps and marshes are not considered flooding.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 15.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey

soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, 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 creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

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. In table 16, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Haplaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other 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 (*3*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*4*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Allegheny series

Soils of the Allegheny series are deep and well drained. They formed in loamy alluvium washed from uplands underlain by sandstone, shale, and limestone. The Allegheny soils are on terraces along the major streams and rivers. Slopes range from 0 to 7 percent.

Allegheny soils are commonly near the Chavies, Monongahela, Buchanan, and Shenval soils. Allegheny soils are finer textured than the Chavies soils; are better drained than and do not have the fragipan typical of the Monongahela soils; are better drained than and do not have the gray mottles in the upper part of the B horizon

that are typical of the Buchanan soils; and are coarser textured and have more brown than the Shenval soils.

Typical pedon of Allegheny fine sandy loam, 1 to 7 percent slopes, at the north end of Gum Avenue in the town of Grottoes:

Ap—0 to 9 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; friable; common fine roots; few fine pores; few rounded sandstone and quartzite pebbles up to 1 inch in diameter; common worm channels and casts; neutral; abrupt smooth boundary.

B1—9 to 19 inches, strong brown (7.5YR 5/6) loam; weak fine subangular blocky structure; friable; few fine roots; common fine and very fine pores; few worm channels and casts; medium acid; gradual wavy boundary.

B2t—19 to 32 inches, strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky and slightly plastic; few fine roots; few thin clay films; few worm channels and casts; strongly acid; gradual wavy boundary.

C1—32 to 43 inches, strong brown (7.5YR 5/6) sandy loam; massive; very friable; few very fine roots; few fine pores; few rounded sandstone and quartzite cobblestones; strongly acid; gradual smooth boundary.

C2—43 to 54 inches, yellowish brown (10YR 5/6) sandy loam; massive; very friable; few sandstone and quartzite cobblestones; strongly acid; clear smooth boundary.

IIC3—54 to 60 inches, stratified layers of sand, gravel, and cobblestones.

The solum is 30 to 40 inches thick. The depth to bedrock is more than 5 feet. Rounded sandstone gravel and cobblestones make up from 0 to 30 percent of the A horizon and from 0 to 10 percent of the B horizon.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is a fine sandy loam or cobbly fine sandy loam.

The B horizon has hue of 10YR and 7.5YR, value of 5, and chroma of 6 through 8. It is loam, sandy clay loam, or clay loam.

The C horizon has hue, value, and chroma similar to those of the B horizon. Some pedons have low-chroma mottles at a depth of more than 36 inches. The C horizon is sandy loam or stratified layers of sand, gravel, and cobblestones.

Aquic Udifluvents

Aquic Udifluvents consist of deep, moderately well drained or somewhat poorly drained soils. They are finer textured than loamy fine sand in the A and B horizons and have an organic carbon content that decreases with depth where the materials are stratified. The soils formed in alluvial materials washed from soils underlain by limestone, sandstone, and shale. They are on flood plains along streams and rivers. Slopes range from 0 to 2 percent.

Aquic Udifluvents commonly are near Fluvaquents and Wheeling, Buckton, Millrock, Frederick, Lodi, and Endcav soils. Aquic Udifluvents are better drained than the Fluvaquents and more poorly drained than the Wheeling, Buckton, Millrock, Frederick, Lodi, or Endcav soils.

Because of the variability of Aquic Udifluvents, a typical pedon is not given. The solum ranges from 30 to 60 inches or more and is underlain by hard limestone in some areas and by stratified layers of gravel and cobblestones in other areas. The content of chert and shale fragments in the solum ranges from 0 to 15 percent. The soils are slightly acid to moderately alkaline.

The A horizon dominantly has hue of 10YR, value of 3 or 4, and chroma of 2 through 4. It ranges from silt loam to sandy loam and is 4 to 12 inches thick.

The B horizon dominantly has hue of 7.5YR through 10YR, value of 3 through 5, and chroma of 2 through 6. Low-chroma mottles are at a depth of less than 20 inches. The B horizon ranges from friable loam to firm, plastic clay and is typically 28 to 42 inches thick.

The C horizon ranges from sandy loam to clay and their gravelly, very gravelly, cobbly, and very cobbly analogues.

Berks series

Soils of the Berks series are moderately deep and well drained. They formed in material weathered from acid shale containing strata of fine-grained sandstone. The Berks soils are on strongly dissected shale uplands, mountaintops, and side slopes. Slopes range from 7 to 70 percent. The Berks soils in this survey area are taxadjuncts to the Berks series because they have a thinner solum and higher values and chromas than are defined for the range in the series. These differences do not significantly affect the use and management of the soils.

Berks soils commonly are near the Weikert, Sequoia, Laidig, Calvin, Lehew, and Dekalb soils. Berks soils have a thicker solum and are deeper to hard shale than the Weikert soils; have a less clayey subsoil and more coarse fragments throughout than the Sequoia soils; contain more coarse fragments in the subsoil than and do not have the fragipan typical of the Laidig soils; have more brown in the subsoil than the Calvin or Lehew soils; and have a more silty subsoil than the Dekalb soils.

Typical pedon of Berks shaly silt loam in an area of Berks-Weikert shaly silt loams, 15 to 25 percent slopes, eroded, 0.75 mile north of U.S. Highway 259, 0.75 mile east of the intersection of U.S. Highway 259 and Route 612:

O1—3 inches to 1 inch, loose leaves and twigs.
O2—1 inch to 0, organic material.
A1—0 to 1 inch, very dark grayish brown (10YR 3/2) loam; weak fine granular structure; friable; many fine roots; 10 percent shale fragments up to 1 inch in diameter; abrupt smooth boundary.
A2—1 to 6 inches, yellowish brown (10YR 5/4) shaly silt loam; weak fine subangular blocky structure; friable; many medium and common fine and very fine roots; few very fine pores; 20 percent shale fragments; very strongly acid; clear, wavy boundary.
B1—6 to 9 inches, yellowish brown (10YR 5/6) shaly silt loam; weak fine and medium subangular blocky structure; friable; many fine and very fine roots; few very fine pores; 25 percent shale fragments; very strongly acid; clear wavy boundary.
B2—9 to 15 inches, yellowish brown (10YR 5/8) shaly silt loam; weak fine and medium subangular blocky structure; friable; few fine and very fine roots; few fine and very fine pores; 35 percent shale fragments; very strongly acid; clear wavy boundary.
C—15 to 31 inches, yellowish brown (10YR 5/8) very shaly silt loam in small pockets and as coatings on shale fragments; massive; friable; few fine and very fine roots in upper 3 inches grading to very few and very fine in lower part; 60 percent light olive brown (2.5Y 5/4) shale fragments; very strongly acid.
R—31 inches, hard shale.

The solum thickness is 9 to 18 inches. The depth to bedrock is 20 to 40 inches. Shale, siltstone, and sandstone make up from 15 to 50 percent of the surface, from 20 to 50 percent of the subsoil, and from 50 to 60 percent of the substratum.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 2 through 4. The B horizon has hue of 10YR, value of 5, and chroma of 4 through 8. It is shaly silt loam, shaly loam, shaly silty clay loam, very shaly silt loam, and very shaly loam. The C horizon has hue of 10YR, value of 5 through 7, and chroma of 4 through 8. It is very shaly silt loam or very shaly loam.

Buchanan series

Soils of the Buchanan series are deep and somewhat poorly drained. They have a fragipan at a depth of about 21 inches. Buchanan soils developed in old colluvium of soils derived largely from acid sandstone and shale. The Buchanan soils are on concave mountain foot slopes and adjacent river terraces. Slopes range from 0 to 15 percent.

Buchanan soils are commonly near the Laidig, Berks, Shelocta Variant, and Monongahela soils. Neither the Berks nor Shelocta Variant soils have a fragipan. Buchanan soils are more poorly drained than the Laidig or Monongahela soils.

Typical pedon of Buchanan fine sandy loam in an area of Buchanan very stony fine sandy loam, 7 to 15 percent slopes, 1 mile north of Peterfish Gap on the Massanutten Mountain, 200 feet northwest of Catherine Furnace Road:

O1—3 inches to 1 inch, loose leaves, twigs, and pine needles.
O2—1 inch to 0, black (10YR 2/1) organic material.
A1—0 to 1 inches, very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; friable; many fine and medium roots, and few coarse roots; 15 percent sandstone fragments up to 3 inches in diameter; strongly acid; abrupt smooth boundary.
A2—1 to 7 inches, yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; friable; common fine and medium roots; common fine pores; 15 percent sandstone fragments up to 6 inches in diameter; strongly acid; clear smooth boundary.
B1t—7 to 13 inches, yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable; slightly sticky when wet; common fine and medium roots; common fine pores; thin patchy clay films; 15 percent sandstone fragments up to 6 inches in diameter; strongly acid; clear smooth boundary.
B2t—13 to 21 inches, yellowish brown (10YR 5/6) sandy clay loam; common fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; friable; slightly sticky and slightly plastic; common fine and medium roots; common fine and medium pores; 15 percent sandstone fragments up to 6 inches in diameter; strongly acid; abrupt smooth boundary.
Bx1—21 to 30 inches, light yellowish brown (2.5Y 6/4) cobbly fine sandy loam; common coarse distinct yellowish brown (10YR 5/6) mottles; weak medium platy structure; brittle; few fine and medium pores; 35 percent sandstone fragments up to 6 inches in diameter; very strongly acid; gradual smooth boundary.
Bx2—30 to 42 inches, yellowish brown (10YR 5/6) cobbly sandy loam; common coarse faint brownish yellow (10YR 6/8) mottles; weak medium platy structure; brittle; common fine and medium pores with pockets of vesicular material; 45 percent highly weathered sandstone up to 6 inches in diameter; strongly acid; gradual wavy boundary.
C—42 to 60 inches, yellowish brown (10YR 5/6) cobbly sandy clay loam; common coarse distinct red (2.5YR 4/6) mottles and few medium faint brownish yellow (10YR 6/8) mottles; massive; friable; 45 percent sandstone cobblestones and stones; very strongly acid.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 5 feet. The depth to the

fragipan ranges from 21 to 24 inches. The content of coarse fragments ranges from 5 to 40 percent in the surface layer, 5 to 35 percent in the subsoil, and 30 to 60 percent in the substratum. These consist chiefly of sandstone and quartzite cobblestones and gravel.

The A horizon has hue of 10YR, value of 3 through 6, and chroma of 1 through 4. It is silt loam, fine sandy loam, or cobbly fine sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 through 6. The Bt horizon is sandy clay loam, clay loam, or loam and their cobbly or gravelly analogues.

The Bx horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 through 6. The Bx horizon is fine sandy loam, sandy loam, sandy clay loam, or clay loam and their cobbly, very cobbly, gravelly, and very gravelly analogues.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 through 6 and has the same textures as the Bx horizon.

Buckton series

Soils of the Buckton series are deep and well drained. They formed in alluvium derived from limestone, calcareous shale, and sandstone. They are on flood plains of the major streams and rivers. Slope ranges from 0 to 4 percent.

Buckton soils commonly are near Aquic Udifluvents and Wheeling and Millrock soils. Buckton soils contain free carbonates, which are not in the Wheeling soils, are better drained than the Aquic Udifluvents, and contain more silt and less sand than the Millrock soils.

Typical pedon of Buckton loam, 0 to 4 percent slopes, 1 mile south of New Market, 3/4 mile east of U.S. Highway 11, and 50 feet west of Smith Creek:

Ap—0 to 8 inches, dark brown (10YR 4/3) loam; moderate fine granular structure; friable; many fine roots; few fine pores; less than 2 percent marl flakes up to 1 millimeter in diameter; common worm casts and channels; moderately alkaline; clear smooth boundary.

C1—8 to 13 inches, dark brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; few fine roots; common fine pores; dark grayish brown (10YR 4/2) coatings on peds; less than 2 percent marl flakes up to 1 millimeter in diameter; common worm casts and channels; moderately alkaline; clear smooth boundary.

C2—13 to 29 inches, dark brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; few fine roots; common fine pores; 5 percent gray (10YR 5/1) and light gray (10YR 7/2) medium-size and irregularly shaped marl; common worm casts; moderately alkaline; clear smooth boundary.

C3—29 to 53 inches, brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable; few fine and medium roots; few fine pores; 2 percent marl flakes up to 1 millimeter in diameter; common worm casts and channels; moderately alkaline; gradual smooth boundary.

C4—53 to 80 inches, grayish brown (10YR 5/2) fine sandy loam; many coarse distinct brownish yellow (10YR 6/6) and strong brown (7.5YR 5/6) mottles; massive; friable; common and medium pores; 5 to 10 percent marl flakes and shells; few pebbles and cobblestones; moderately alkaline.

The depth to hard bedrock is more than 5 feet. The content of secondary lime concretions or marl flakes, and snail shells ranges from 0 to 5 percent in the solum and increases with depth. Sandstone, shale, and chert fragments up to 6 inches in diameter make up from 0 to 2 percent of the upper 40 inches of the profile and from 0 to 20 percent of the profile below 40 inches.

The A horizon has hue of 10YR, value of 4, and chroma of 3 or 4.

The C horizon has hue of 10YR, value of 3 through 5, and chroma of 2 through 4. In some pedons it contains brown or yellow mottling. The horizon is loam, silt loam, and fine sandy loam. Stratification is common.

Burketown series

Soils of the Burketown series are deep and moderately well drained. They formed in coarse-loamy alluvium weathered from acid sandstone and shale. The Burketown soils are on terraces along the major streams and rivers. Slopes range from 2 to 10 percent.

Burketown soils are commonly near Monongahela, Shenval, Frederick, and Millrock soils. Burketown soils have less clay in the subsoil than the Monongahela soils, have more brown and less clay in the subsoil than the Shenval and Frederick soils, and have a fragipan, which is not in the Millrock, Shenval, or Frederick soils.

Typical pedon of Burketown fine sandy loam, 2 to 10 percent slopes, 1/4 mile north of the North River (Augusta County line), 200 feet east of the intersection of Route 994 and the CW Railroad:

Ap—0 to 11 inches, brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; few fine roots; few fine pores; light yellowish brown (10YR 6/4) spots and streaks; medium acid; abrupt smooth boundary.

B1—11 to 16 inches, yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; few very fine pores; medium acid; gradual wavy boundary.

B21t—16 to 24 inches, yellowish brown (10YR 5/6) fine sandy loam; moderate fine subangular blocky structure; friable; few very fine roots; few fine pores; thin patchy clay films; few strongly weathered rounded sandstone pebbles; few worm casts; strongly acid; clear smooth boundary.

Bx—24 to 44 inches, variegated strong brown (7.5YR 5/6), yellowish red (5YR 4/6), light brownish gray (10YR 6/2), and pale brown (10YR 6/3) fine sandy loam; massive; firm, brittle; few strongly weathered rounded sandstone pebbles; very strongly acid; gradual irregular boundary.

IIB22t—44 to 60 inches, yellowish red (5YR 4/6) sandy clay loam; moderate fine subangular blocky structure; friable; common fine pores; thin patchy clay films; few rounded pebbles of sandstone and shale; very strongly acid.

The solum thickness ranges from 40 to 60 inches or more. The depth to bedrock is more than 6 feet. The depth to the fragipan ranges from 18 to 36 inches. Sandstone and chert pebbles make up 0 to 10 percent of the solum.

The A horizon has value of 4 through 6 and chroma of 3 through 6.

The B1 horizon has hue of 10YR, value of 4 or 5, and chroma of 4 through 6. The Bt horizon has hue of 7.5YR through 2.5Y, value of 5 or 6, and chroma of 3 through 6. The Bt horizon is sandy loam, fine sandy loam, or loam. The Bx horizon has hue of 10YR through 5YR, value of 4 through 6, and chroma of 3 through 8. It is sandy loam or fine sandy loam. The IIBt horizon has hue of 5YR or 2.5YR, value of 3 through 5, and chroma of 6 through 8. It ranges from sandy loam to clay.

Calvin series

Soils of the Calvin series are moderately deep and well drained. They formed in the weathered products of shale, siltstone, and fine-grained sandstone and are on mountain side slopes and mountaintops. Slopes range from 5 to 65 percent. The Calvin soils in this survey area are mapped only with Dekalb and Lehew soils.

Calvin soils are commonly near Berks, Dekalb, Lehew, and Weikert soils. Calvin soils have more red in the solum than the Berks or Dekalb soils, have less sand and fewer sandstone fragments in the subsoil than the Lehew soils, and have a thicker solum and more red in the subsoil than the Weikert soils.

Typical pedon of Calvin shaly loam in an area of Lehew, Dekalb, and Calvin very stony soils, 45 to 65 percent slopes, 200 feet west of Sand Spring road, 1/2 mile northwest of the intersection of Big Bear Hollow and Sugar Run:

O2—1 inch to 0, black (5YR 2/1) organic material; 50 percent shale fragments up to 1 inch in diameter.

A1—0 to 1 inch, dark reddish gray (5YR 4/2) shaly loam; weak fine granular structure; friable; many fine roots; 30 percent shale fragments up to 1 inch in diameter; very strongly acid; abrupt smooth boundary.

A2—1 to 7 inches, reddish brown (5YR 4/4) shaly loam; weak fine granular structure; friable; many fine and medium roots; few fine pores; 30 percent shale fragments up to 6 inches in diameter; very strongly acid; clear wavy boundary.

B2—7 to 21 inches, reddish brown (5YR 4/4) very shaly loam; weak fine subangular blocky structure; friable; many fine and medium roots; few thin clay films; 60 percent dusky red (2.5YR 3/2) shale fragments up to 6 inches in diameter; very strongly acid; abrupt wavy boundary.

C—21 to 26 inches, reddish brown (5YR 4/4) very flaggy loam; soil material in pockets and as coatings on shale fragments; massive; friable; 80 percent dusky red (2.5YR 3/2) shale fragments and flagstones; very strongly acid.

R—26 inches, bedrock.

The solum is 20 to 28 inches thick. The depth to bedrock ranges from 20 to 40 inches. Shale, siltstone, and fine-grained sandstone fragments and flagstones make up from 10 to 50 percent of the solum and from 50 to 80 percent of the substratum. Stones cover from 0 percent to 3 percent of the surface.

The A horizon has hue of 5YR and 7.5YR, value of 2 through 4, and chroma of 2 through 4.

The B horizon has hue of 5YR, value of 4, and chroma of 3 or 4. It is silt loam, loam, and light clay loam and their shaly, channery, very shaly, or very channery analogues.

The C horizon has the same hue, value, and chroma as the B horizon.

Carbo series

Soils of the Carbo series are moderately deep and well drained. They formed in the weathered products of limestone or interbedded limestone and calcareous shale. They are on gently undulating to rolling uplands. Slopes range from 0 to 20 percent.

Carbo soils are commonly near the Endcav, Chilhowie, and Edom soils. Carbo soils have a thinner solum than the Endcav or Edom soils and a thicker solum than the Chilhowie soils.

Typical pedon of Carbo silt loam in an area of Carbo-Endcav-Rock outcrop complex, 7 to 15 percent slopes, eroded, 3-1/2 miles southwest of New Market, 1,200 feet north of the intersection of Routes 796 and 620:

Ap—0 to 10 inches, dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable; many fine and very fine roots; few fine pores; many worm casts and channels; 2 percent iron oxide concretions up to 1/4 inch in diameter; slightly acid; abrupt smooth boundary.

B2t—10 to 25 inches, strong brown (7.5YR 5/6) clay; common coarse distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky, very plastic; common fine and very fine roots; few fine pores; thick continuous clay films on faces of peds; common worm casts and channels; 2 percent oxide concretions up to 1/2 inch in diameter; few black (N 2/0) oxide stains; medium acid; clear smooth boundary.

B3t—25 to 32 inches, dark yellowish brown (10YR 4/4) clay; weak medium subangular blocky structure; firm, sticky, very plastic; few very fine roots; few fine pores; thick continuous clay films on faces of peds; few worm casts and channels; 2 percent oxide concretions up to 1/4 inch in diameter; common black (N 2/0) oxide stains; mildly alkaline; abrupt wavy boundary.

R—32 inches, limestone bedrock.

The solum thickness and depth to bedrock ranges from 24 to 38 inches. Manganese and iron concretions make up 0 to 5 percent in the solum.

The A horizon has hue of 10YR or 7.5YR, value of 4, and chroma of 3 or 4.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 8. Some pedons have high-chroma mottles in the lower part of the B horizon.

Chavies series

Soils of the Chavies series are deep and well drained. They formed in coarse-loamy alluvium from areas mostly underlain by sandstone and shale and in some places limestone. The soils are on low terraces along the larger streams of the county. Slope ranges from 0 to 4 percent. The Chavies soils in this survey area are a taxadjunct to the Chavies series. They have slightly higher base saturation than is defined for the range in the series. This difference does not significantly affect the use and management of the soils.

Chavies soils are commonly near Allegheny, Craigsville, Monongahela, Millrock, and Tioga soils. Chavies soils have less clay and more sand than the Allegheny soils, have less gravel and fewer cobblestones than the Craigsville soils, do not have the fragipan typical of the Monongahela soils, and have an argillic horizon not typical of the Millrock and Tioga soils.

Typical pedon of Chavies fine sandy loam, 0 to 4 percent slopes, 6/10 mile east of Timberville, 600 feet south of the Southern Railroad:

Ap—0 to 11 inches, dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; common very fine and fine roots; few fine pores; few worm casts and channels; 1 percent rounded sandstone pebbles and cobblestones up to 4 inches in diameter; neutral; abrupt smooth boundary.

B21t—11 to 22 inches, brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable; few very fine roots; few fine pores; few thin clay films; few fine black (10YR 2/1) coatings and stains on ped surfaces; slightly acid; gradual smooth boundary.

B22t—22 to 34 inches, brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable; few fine pores; thin continuous clay films; few fine black (10YR 2/1) coatings and stains on ped surfaces; medium acid; gradual smooth boundary.

B23t—34 to 42 inches, brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine pores; common thin clay films; few fine black (10YR 2/1) coatings and stains on ped surfaces; few worm casts and channels; medium acid; gradual smooth boundary.

C1—42 to 72 inches, brown (7.5YR 4/4) fine sandy loam; massive; friable; common fine pores; few fine distinct black (10YR 2/1) coatings and stains in cracks; few worm casts and channels; medium acid.

The solum is 30 to 48 inches thick. The depth to bedrock is more than 5 feet. Rounded sandstone pebbles up to 3 inches in diameter make up from 1 to 15 percent of the A horizon and from 0 to 5 percent of the B horizon.

The A horizon has hue of 10YR and 7.5YR, value of 4, and chroma of 2 through 4.

The B horizon has hue of 10YR, 7.5YR, and 5YR; value of 4 or 5, and chroma of 4 through 6. It is fine sandy loam or loam.

The C horizon has the same hue, value, and chroma as the B horizon. The C horizon is fine sandy loam, sandy loam, and loamy sand. Some pedons have a IIC horizon below a depth of 40 inches that is very gravelly fine sandy loam, sandy loam, or loamy sand.

Chilhowie series

Soils of the Chilhowie series are moderately deep and well drained. They formed in the weathered products of interbedded calcareous shale and limestone, and they are on hilly uplands. Slopes range from 2 to 45 percent.

Chilhowie soils are commonly near Carbo, Edom, and Endcav soils and have a thinner solum than any of those soils.

Typical pedon of Chilhowie silty clay in an area of Chilhowie silty clay, rocky, 7 to 15 percent slopes, eroded, 4 miles south of New Market, 1 mile southeast of the intersection of U.S. Route 11 and Route 796,

1,700 feet west of the interchange of Routes 796 and 620:

Ap—0 to 5 inches, dark brown (10YR 4/3) silty clay; moderate medium granular structure; firm, slightly sticky, plastic; common fine roots; common worm casts and channels; neutral; abrupt wavy boundary.
B2t—5 to 13 inches, strong brown (7.5YR 5/6) clay; moderate fine subangular blocky structure; very firm, very sticky, plastic; few fine roots; few fine pores; thin continuous clay films on faces of peds; few oxide concretions up to 2 millimeters in diameter; common worm casts and channels; neutral; abrupt irregular boundary.
C—13 to 25 inches, strong brown (7.5YR 5/6) very channery clay; massive; firm, sticky, plastic; few fine roots between fragments; 75 percent shale and limestone fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.
R—25 inches, hard interbedded shale and limestone; strongly effervescent.

The solum thickness is 10 to 20 inches. The depth to bedrock is 20 to 40 inches. Calcareous shale and limestone fragments make up from 0 to 15 percent of the solum and from 25 to 80 percent of the substratum. Rock outcrops cover from 0 to 10 percent of the surface.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 through 4. It is silty clay or silty clay loam.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 through 8. It is clay or silty clay.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 through 8. It is very channery clay, channery silty clay, flaggy silty clay, and flaggy clay.

Cotaco series

Soils of the Cotaco series are deep and moderately well drained. They formed in alluvium or colluvium from acid sandstone and shales and are on terraces. Slopes range from 0 to 7 percent.

Cotaco soils are commonly near the Laidig, Buchanan, Purdy, and Allegheny soils. Cotaco soils do not have the fragipan typical of the Laidig and Buchanan soils or the mottled subsoil typical of the Allegheny soils, and they have more brown than the Purdy soils.

Typical pedon of Cotaco cobbly fine sandy loam, 0 to 7 percent slopes, 1 mile north of Grottoes, in a hardwood forest 600 feet west of the intersection of U.S. Route 340 and State Route 629:

O1—3 inches to 1 inch, loose leaves and twigs.
O2—1 inch to 0, black (5YR 2/1) organic material.
A2—0 to 7 inches, pale brown (10YR 6/3) cobbly fine sandy loam; weak fine subangular blocky structure; friable; many fine and very fine and common medium and coarse roots; few fine pores; 20 percent sandstone gravel and cobblestones; less than 1 inch of the upper part is dark grayish brown (10YR 4/2); very strongly acid; gradual smooth boundary.
B1—7 to 15 inches, yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few fine and very fine and common medium and coarse roots; few fine pores; very few thin clay films; 10 percent sandstone gravel and cobblestones; very strongly acid; gradual smooth boundary.
B21t—15 to 26 inches, yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and very fine and common medium and coarse roots; few fine pores; common thin clay films; 5 percent sandstone gravel; old root channels filled with dark grayish brown (10YR 4/2) loam; very strongly acid; gradual wavy boundary.
B22t—26 to 36 inches, yellowish brown (10YR 5/8) clay loam; common medium distinct pale brown (10YR 6/3), red (2.5YR 4/6), and dark grayish brown (10YR 4/2) mottles and few medium distinct light brownish gray (10YR 6/2) mottles; weak thick platy structure parting to moderate fine subangular blocky; firm, slightly sticky and slightly plastic; few fine roots; common very fine pores; reddish brown (5YR 4/4) and very dark gray (10YR 3/1) common thin clay films; 5 percent sandstone gravel; old root channel 2 inches in width in the lower part; very strongly acid; clear smooth boundary.
B23t—36 to 45 inches, yellowish brown (10YR 5/8) clay loam; common medium distinct red (2.5YR 4/6) and light gray (10YR 7/2) mottles; weak thick platy structure; firm, slightly brittle; very few fine roots; few fine pores; very few thin clay films; less than 5 percent sandstone gravel; strongly acid; gradual smooth boundary.
C—45 to 60 inches, variegated red (2.5YR 4/6), yellowish brown (10YR 5/4 and 5/8), grayish brown (10YR 5/2), and light gray (10YR 7/1) cobbly clay loam; massive; firm; very few fine roots; few fine pores; 30 percent sandstone gravel and cobblestones; strongly acid.

The solum thickness ranges from 30 to 50 inches. The depth to bedrock is more than 5 feet. Rounded gravel and cobblestones make up from 0 to 30 percent of the A horizon, 0 to 10 percent of the B horizon, and 5 to 30 percent of the C horizon. These consist chiefly of sandstone and quartzite.

The A horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is cobbly fine sandy loam or fine sandy loam.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 4 through 8. It is clay loam, sandy clay loam, or loam.

The C horizon has hue of 2.5YR through 10YR, values of 4 through 7, and chroma of 1 through 8. It is clay loam, sandy clay loam, or sandy loam and their gravelly and cobbly analogues. Some pedons are underlain by stratified layers of sand, silt, gravel, or cobblestones.

Cotaco Variant

Soils of the Cotaco Variant are deep and moderately well drained. They formed in alluvium or colluvium from acid sandstone and shale. The Cotaco Variant soils are on foot slopes and terraces. Slopes range from 1 to 7 percent.

Cotaco Variant soils are commonly near the Allegheny, Laidig, Monongahela, and Purdy soils and are similar to the Cotaco soils. Cotaco Variant soils have mottles in the subsoil, which is not typical of the Allegheny soils, do not have the fragipan that is typical of the Laidig and Monongahela soils, and have more brown than the Purdy soils. Cotaco Variant soils are more sticky in the upper part of the subsoil than Cotaco soils and have a higher shrink-swell potential.

Typical pedon of Cotaco Variant cobbly loam, 1 to 7 percent slopes, 0.25 mile east of the junction of State Routes 759 and 625, 100 feet south of State Route 625:

O1—3 inches to 1 inch, undecomposed loose leaves and twigs.

O2—1 inch to 0, very dark grayish brown (10YR 3/2) mat of leaves and twigs, some partially decayed.

A2—0 to 5 inches, yellowish brown (10YR 5/4) cobbly loam; weak fine granular structure; friable; many fine and medium roots; few fine pores; 20 percent rounded sandstone fragments up to 6 inches in diameter; slightly acid; abrupt smooth boundary.

B1—5 to 13 inches, yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable, sticky; common fine medium and coarse roots; common fine pores; 10 percent rounded sandstone fragments up to 8 inches in diameter; very strongly acid; clear smooth boundary.

B21t—13 to 26 inches, yellowish brown (10YR 5/6) clay loam; weak fine subangular blocky structure; friable, very sticky, slightly plastic; few fine medium and coarse roots; common fine pores; thin discontinuous clay films; 5 percent rounded sandstone fragments up to 6 inches in diameter; very strongly acid; clear smooth boundary.

B22t—26 to 36 inches, yellowish brown (10YR 5/6) loam; common coarse distinct strong brown (7.5YR 5/6) mottles and few fine faint light yellowish brown (10YR 6/4) and light gray (10YR 7/2) mottles; weak very fine subangular blocky structure; friable, sticky; few very fine roots; few fine pores; very strongly acid; 5 percent rounded sandstone fragments up to 3 inches in diameter; very strongly acid; gradual smooth boundary.

B3—36 to 60 inches, strong brown (7.5YR 5/8) clay; many coarse distinct yellowish red (5YR 4/8), light yellowish brown (2.5Y 6/4), and light gray (2.5Y 7/2) mottles; weak thick platy structure parting to moderate fine subangular blocky; firm, slightly sticky; few very fine roots; many fine medium and coarse pores; 10 to 15 percent partially rounded sandstone and quartzite fragments up to 6 inches in diameter; strongly acid.

The solum thickness ranges from 40 inches to more than 60 inches. The depth to bedrock is more than 5 feet. Coarse fragments of sandstone and quartzite make up 20 to 35 percent of the A horizon and 0 to 15 percent of the B horizon.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 through 8.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 8. It is silt loam, loam, clay loam, and clay.

Some pedons are underlain by stratified sand, gravel, and cobblestones at a depth of 3-1/2 feet.

Craigsville series

Soils of the Craigsville series are deep and well drained. They formed in alluvium derived from shale, sandstone, and quartzite. The Craigsville soils are on low terraces adjacent to flood plains of the larger streams and rivers. Slopes range from 0 to 4 percent.

Craigsville soils commonly are near Chavies, Allegheny, and Monongahela soils and Typic Udorthents. Craigsville soils have more gravel and cobblestones than the Chavies, Allegheny, or Monongahela soils; do not have the fragipan typical of the Monongahela soils; and have a cambic B horizon not typical of Typic Udorthents.

Typical pedon Craigsville cobbly fine sandy loam, 0 to 4 percent slopes, in the Shoemaker River Valley, 125 feet east of the intersection of Routes 612 and 817:

Ap—0 to 8 inches, dark brown (7.5YR 4/2) cobbly fine sandy loam; weak fine granular structure; friable; many fine roots; few fine pores; 20 percent rounded sandstone cobblestones; slightly acid; abrupt smooth boundary.

B2—8 to 22 inches, reddish brown (5YR 4/4) cobbly loam; weak fine subangular blocky structure; friable; common fine and few medium roots; common fine pores; 35 percent rounded sandstone fragments up to 8 inches in diameter; slightly acid; gradual wavy boundary.
IIC—22 to 60 inches, brown (7.5YR 5/4) very cobbly sandy loam; single grain; loose; few fine roots; 60 percent rounded sandstone fragments up to 12 inches in diameter; strongly acid.

The solum thickness ranges from 20 to 40 inches. The depth to bedrock is more than 6 feet. Sandstone gravel and cobblestones make up 35 to 50 percent of the subsoil and 50 to 70 percent of the substratum.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 through 4.

The B horizon has hue of 5YR through 10YR, value of 4, and chroma of 4 through 6. It is gravelly, very gravelly, cobbly, or very cobbly analogues of sandy loam or loam.

The C horizon has hue of 7.5YR, value of 4 or 5, and chroma of 4. It is very gravelly or very cobbly sandy loam or very gravelly or very cobbly loamy sand.

Dekalb series

Soils of the Dekalb series are moderately deep and well drained. They formed in weathered products of sandstone or interbedded sandstone and shale and are on mountain side slopes and mountaintops. Slopes range from 5 to 65 percent. Dekalb soils in this survey area are mapped only with Calvin and Lehew soils.

Dekalb soils are commonly near Berks, Calvin, Lehew, and Weikert soils. Dekalb soils have more sand and less silt than the Berks, Calvin, or Lehew soils and are deeper to bedrock than the Weikert soils.

Typical pedon of Dekalb cobbly sandy loam in an area of Lehew, Dekalb, and Calvin cobbly soils, 5 to 15 percent slopes, 4/10 mile east of Hall Spring and 25 feet south of Forest Service road:

O1—3 inches to 1 inch, loose leaves and twigs.
O2—1 inch to 0, black (5YR 2/1) organic material.
A1—0 to 2 inches, very dark gray (10YR 3/1) sandy loam; weak fine granular structure; friable; common fine roots; many medium and coarse roots; 10 percent angular sandstone fragments up to 3 inches in length; very strongly acid; abrupt smooth boundary.
A2—2 to 6 inches, dark gray (10YR 4/1) cobbly sandy loam; weak fine granular structure; friable; many fine roots; common medium and coarse roots; 20 percent angular sandstone fragments up to 3 inches in length; 1 inch layer of brown (7.5YR 4/4) at base of horizon; very strongly acid; abrupt smooth boundary.
B21—6 to 15 inches, dark yellowish brown (10YR 4/4) channery sandy loam; weak fine subangular blocky structure; friable; many fine medium and coarse roots; 20 percent angular sandstone fragments up to 3 inches in length; very strongly acid; gradual smooth boundary.
B22—15 to 34 inches, yellowish brown (10YR 5/4) flaggy sandy loam; weak fine subangular blocky structure; many fine medium and coarse roots; 30 percent sandstone flagstones, 15 percent sandstone channery fragments; very strongly acid.
R—34 inches, sandstone.

The solum is 20 to 40 inches thick. The depth to bedrock ranges from 20 to 40 inches. Sandstone fragments up to 6 inches long make up 10 to 25 percent of the A horizon and upper part of the B horizon and from 20 to 35 percent of the lower part of the B horizon. Sandstone flagstones make up 0 to 10 percent of the A horizon.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 4. It is sandy loam and fine sandy loam and their channery, cobbly, or stony analogues.

The B horizon has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 4 through 6. It is fine sandy loam and sandy loam or their channery or flaggy analogues.

Drall series

Soils of the Drall series are deep and excessively drained. They formed in the weathered products of sandstone and quartzite and are on upper mountain side slopes and mountaintops. Slopes range from 40 to 70 percent.

Drall soils commonly are near the Laidig, Berks, Weikert, Dekalb, Lehew, and Calvin soils. Dekalb soils have more sand than any of those soils; have more coarse fragments throughout the profile than the Laidig soils; and are deeper than the Berks, Weikert, Dekalb, Lehew, or Calvin soils.

Typical pedon of Drall gravelly sandy loam in an area of Drall extremely stony sandy loam, 40 to 70 percent slopes, 1-1/2 miles southwest of Martin Bottom, 4/10 mile northwest of Cub Run Road:

O1—5 to 2 inches, loose leaves, twigs, and pine needles.
O2—2 inches to 0, very dark brown (10YR 2/2) organic material.
A1—0 to 3 inches, gray (10YR 5/1) gravelly sandy loam; massive; very friable; many fine roots, common medium and coarse roots; 20 percent rock fragments; strongly acid; abrupt smooth boundary.
A2—3 to 6 inches, light gray (10YR 7/1) gravelly sandy loam; massive; very friable; many fine roots, common medium and coarse roots; 20 percent rock fragments; strongly acid; abrupt smooth boundary.

B—6 to 36 inches, yellowish brown (10YR 5/6) very stony sand; single grain; loose common fine medium and coarse roots; 50 percent sandstone fragments 4 inches to 2 feet in diameter; strongly acid; gradual smooth boundary.

C—36 to 60 inches, yellowish brown (10YR 5/6) very stony sand; single grain; loose; few fine roots; 60 percent sandstone fragments up to 2 feet in diameter; strongly acid.

The solum thickness ranges from 20 to 40 inches. The depth to bedrock is more than 40 inches. Sandstone and quartzite stones, cobblestones, and channery fragments make up 20 to 40 percent of the A horizon and 40 to 60 percent of the underlying horizons.

The A horizon has hue of 10YR, value of 4 through 7, and chroma of 1 through 3. It is stony sand, stony loamy sand, or stony sandy loam.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 4 through 8. It is stony or very stony sand or stony or very stony loamy sand.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 through 8. It is stony or very stony sand or stony or very stony loamy sand.

Edom series

Soils of the Edom series are deep and well drained. They formed in the weathered products of interbedded calcareous shale and shaly limestone. The Edom soils are on uplands in areas with a distinct dendritic drainage system. Slopes range from 2 to 25 percent.

Edom soils commonly are near the Chilhowie, Endcav, Sequoia, Swimley, and Frederick soils. The Edom soils have a thicker solum than the Chilhowie soils and a thinner solum than the Endcav soils, are less acid than the Sequoia soils, have more brown in the B horizon than the Swimley soils, and have a thinner solum and are less acid than the Frederick soils.

Typical pedon of Edom silty clay loam, 7 to 15 percent slopes, eroded, 5 miles north of Harrisonburg on the west side of Route 11, 1/2 mile south of Melrose Caverns:

Ap—0 to 6 inches, yellowish brown (10YR 5/4) silty clay loam; common fine distinct strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; common very fine roots; few fine pores; 2 percent chert fragments up to 1/2 inch in diameter; slightly acid; abrupt smooth boundary.

B21t—6 to 15 inches, strong brown (7.5YR 5/6) clay; moderate fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; thin continuous clay films; 4 percent manganese stains; common worm casts; streaks of yellowish brown (10YR 5/4); slightly acid; gradual wavy boundary.

B22t—15 to 24 inches, strong brown (7.5YR 5/6) clay; common fine distinct light yellowish brown (2.5YR 6/4) and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine pores; few fine roots; thin continuous yellowish brown (10YR 5/4) clay films; neutral; gradual wavy boundary.

B3t—24 to 34 inches, strong brown (7.5YR 5/6) clay; moderate fine subangular blocky structure; friable; few fine roots; few fine pores; thin continuous clay films; 35 percent pockets of mixed yellowish brown (10YR 5/6), light yellowish brown (2.5YR 6/4), grayish brown (10YR 5/2), strong brown (7.5YR 5/6), and yellowish red (5YR 4/8) silt loam; neutral; gradual wavy boundary.

C—34 to 70 inches, yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), light yellowish brown (2.5YR 6/4), grayish brown (10YR 5/2), and yellowish red (5YR 4/8) shaly silty clay loam; massive; friable; few fine roots; thin discontinuous clay films; 20 to 30 percent shale fragments; 30 percent pockets of strong brown (7.5YR 5/6) clay with moderate fine subangular blocky structure; neutral.

The solum is 20 to 40 inches thick. The depth to bedrock ranges from 3-1/2 to 6 feet or more. Shale fragments or limestone flagstones make up 2 to 5 percent of the A horizon, 0 to 10 percent of the B horizon, and 20 to 70 percent of the C horizon.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The B horizon has hue of 7.5YR or 5YR, value or 4 or 5, and chroma of 6. Some pedons have a few low-chroma mottles in the lower part of the B horizon as a result of weathered shale fragments. The B horizon is clay or silty clay.

The C horizon is silty clay loam, silty clay, or clay.

Endcav series

Soils of the Endcav series are deep and well drained. They formed in residuum weathered from high-grade limestone. They are on uplands. Slopes range from 2 to 15 percent.

Endcav soils are commonly near the Chilhowie, Carbo, Edom, and Frederick soils. Endcave soils have a thicker solum than the Chilhowie, Carbo, or Edom soils and a thinner solum than the Frederick soils.

Typical pedon of Endcav silt loam, 7 to 15 percent slopes, eroded, 2 miles southwest of New Market, 30 feet south of Route 793, and 800 feet west-northwest of the intersection of Route 793 and U.S. Route 11:

Ap—0 to 7 inches, dark yellowish brown (10YR 4/4) silt loam; moderate, medium granular structure; friable; common fine and very fine roots; many fine pores; common worm channels and casts; 2 percent fragments of chert up to 1 inch in diameter; slightly acid; abrupt smooth boundary.

B21t—7 to 16 inches, strong brown (7.5YR 5/6) clay; moderate medium subangular blocky structure; firm, sticky, plastic; few fine and very fine roots; few fine pores; thin continuous clay films on faces of peds; 3 percent dark oxide concretions up to 2 millimeters in diameter; medium acid; clear smooth boundary.

B22t—16 to 26 inches, strong brown (7.5YR 5/8) clay; moderate medium subangular blocky structure; firm, sticky, plastic; few fine roots; few fine pores; thin continuous clay films on face of peds; 1 percent dark oxide concretions up to 2 millimeters in diameter; medium acid; clear smooth boundary.

B23t—26 to 44 inches, yellowish brown (10YR 5/8) clay; few fine distinct pale brown (10YR 6/3), strong brown (7.5YR 5/6), and yellowish red (5YR 5/8) mottles; moderate coarse angular blocky structure parting to moderate medium subangular blocky; firm, very sticky, very plastic; few fine roots; few fine pores; thin continuous clay films on faces of peds; few slickensides; 3 percent dark oxide concretions up to 2 millimeters in diameter; 7 percent oxide stains; neutral; gradual wavy boundary.

B24t—44 to 57 inches, yellowish brown (10YR 5/6) clay; many coarse distinct yellowish red (5YR 4/8), strong brown (7.5YR 5/6), and reddish yellow (10YR 6/8) mottles; moderate coarse subangular blocky structure; firm, sticky, very plastic; thin continuous clay films on faces of peds; few slickensides; 5 percent oxide stains; neutral; abrupt wavy boundary; limestone ledges.

R—57 inches, limestone bedrock.

The solum thickness is 40 to 60 inches. The depth to bedrock is dominantly 40 to 60 inches. Fragments of limestone and chert make up 0 to 5 percent of the A horizon and 0 to 15 percent of the B horizon and commonly increase with depth. Black mineral oxide concretions are few to common.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 8. Some pedons have a B1 horizon that is silty clay loam.

Fauquier series

Soils of the Fauquier series are deep and well drained. They formed in residuum weathered from greenstone on the lower slopes of the Blue Ridge Mountains. Slopes range from 7 to 50 percent.

Fauquier soils are commonly near Sylco, Hawksbill, and Myersville soils. Fauquier soils have more clay in the subsoil than any of those soils and have a thicker solum than the Sylco soils and fewer rock fragments than the Sylco or Hawksbill soils.

Typical pedon of Fauquier silt loam in an area of Fauquier stony silt loam, 7 to 15 percent slopes, eroded, 300 feet south of Beldor Community:

Ap—0 to 7 inches, reddish brown (5YR 4/4) silt loam; moderate fine granular structure; friable; common fine and very fine roots, many medium and coarse roots; 5 percent greenstone fragments up to 6 inches in diameter; common worm casts and channels; medium acid; clear wavy boundary.

B21t—7 to 21 inches, yellowish red (5YR 4/6) clay; moderate fine subangular blocky structure; friable, sticky and plastic; many fine medium and coarse roots; common fine pores; thin continuous clay films; 4 percent greenstone fragments up to 3 millimeters in diameter; few worm casts and channels; medium acid; gradual smooth boundary.

B22t—21 to 35 inches, red (2.5YR 4/6) clay; moderate fine subangular blocky structure; friable, sticky and plastic; few fine medium and coarse roots; few very fine pores; moderately thick continuous clay films; 4 percent greenstone fragments up to 3 millimeter in diameter; medium acid; gradual irregular boundary.

C1—35 to 45 inches, brownish yellow (10YR 6/8) silt loam; massive; friable; few fine roots; thin red (2.5YR 4/6) clay flows in seams; thin strata of yellowish brown (10YR 5/4) soft siltstone; common black oxide stains; medium acid; gradual wavy boundary.

C2—45 to 60 inches, strongly weathered rock that crushes easily to silt loam; massive; friable; medium acid.

The solum is 20 to 40 inches thick. The depth to bedrock is more than 3-1/2 feet. Greenstone fragments up to 6 inches in diameter make up from 2 to 15 percent of the A horizon, 0 to 10 percent of the B horizon, and 0 to 35 percent of the C horizon.

The A horizon has hue of 7.5YR or 5YR, value of 4, and chroma of 4.

The B horizon has hue of 5YR and 2.5YR, value of 4, and chroma of 6 through 8. It is silty clay loam or clay.

Fluvaquents

Fluvaquents consist of deep, somewhat poorly drained or poorly drained soils that have an organic-carbon content that decreases irregularly with depth. The soils formed in alluvial materials derived from limestone, shale, and sandstone. They are on flood plains of streams and rivers. Slopes range from 0 to 2 percent.

Fluvaquents commonly are near Aquic Udifluvents, and Frederick, Lodi, Edom, and Chilhowie soils and are more poorly drained than any of those soils.

Because of the variability of Fluvaquents, a typical pedon is not given. The solum ranges in thickness from 24 inches to more than 60 inches. It is underlain in some areas by hard limestone and in other areas by stratified gravel and cobblestones. The gravel content ranges from 0 to 20 percent in the solum. The soils are slightly acid to moderately alkaline.

The A horizon dominantly has hue of 7.5YR to 10YR, value of 3 through 5, and chroma of 2 or less. It ranges from fine sandy loam to silty clay loam and is 4 to 16 inches thick.

The B horizon dominantly has hue of 7.5YR to 2.5Y, value of 3 through 7, and chroma of 0 through 8. High-and-low chroma mottles are common. The B horizon ranges from friable sandy loam to firm plastic clay and is from 16 inches to more than 44 inches thick.

The C horizon ranges from loamy sand to clay and their gravelly, very gravelly, cobbly, and very cobbly analogues.

Frederick series

Soils of the Frederick series are deep and well drained. The soils formed in residuum weathered from dolomitic and cherty limestone. They are on uplands. Slopes range from 2 to 45 percent.

Frederick soils are commonly near Lodi, Endcav, Edom, and Timberville Variant soils. Frederick soils have a thicker solum than the Lodi, Endcav, or Edom soils and have more red in the subsoil, more clay, and fewer coarse fragments than the Timberville Variant soils.

Typical pedon of Frederick silt loam in an area of Frederick and Lodi silt loams, 7 to 15 percent slopes, eroded, 1 mile south Harrisonburg, 450 feet southeast of Route 710, and 1,000 feet east of the intersection of Routes 710 and 679:

Ap—0 to 9 inches, brown (10YR 4/3) silt loam; moderate fine granular structure; friable; common fine and very fine roots; 15 percent chert fragments up to 3 inches in diameter; medium acid; abrupt smooth boundary.

B1t—9 to 13 inches, strong brown (7.5YR 5/6) clay loam; many coarse distinct yellowish brown (10YR 5/4) mottles and streaks; weak fine subangular blocky structure; friable; common fine and very fine roots; common very fine pores; few thin clay films; 15 percent chert fragments up to 6 inches in diameter; medium acid; clear wavy boundary.

B21t—13 to 26 inches, yellowish red (5YR 4/6) clay; common medium distinct (10YR 5/4) mottles representing thin streaks of sand and silt grains in the form of skeletans; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; few very fine roots; common very fine pores; thin continuous clay films; 3 percent chert fragments up to 6 inches in diameter; strongly acid; gradual wavy boundary.

B22t—26 to 39 inches, yellowish red (5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/6) and red (2.5YR 4/6) mottles; moderate medium blocky structure; firm, sticky and plastic; common very fine pores; moderately thick continuous clay films; 3 percent chert fragments up to 3 inches in diameter; strongly acid; gradual wavy boundary.

B23t—39 to 59 inches, yellowish red (5YR 4/6) clay; many coarse distinct yellowish brown (10YR 5/4) and red (2.5YR 4/6) mottles; moderate fine and medium blocky structure; firm, sticky and plastic; moderately thick continuous yellowish brown (10YR 5/4) clay films; 5 percent chert fragments up to 6 inches in diameter; very strongly acid; clear smooth boundary.

B24t—59 to 72 inches, red (2.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/4) and brownish yellow (10YR 6/6) mottles; moderate medium blocky structure; firm, sticky and plastic; moderately thick red (2.5YR 4/6) and yellowish brown (10YR 5/4) clay films; very strongly acid.

The solum thickness is 60 to 80 inches. The depth to bedrock is 6 feet or more. Fragments of chert and sandstone make up 0 to 50 percent of the surface layer and 0 to 15 percent of the subsoil.

The A horizon has hue of 10YR to 5YR, value of 4 through 6, and chroma of 2 through 6. It is silt loam or silty clay loam and their cherty and very cherty analogues.

The B horizon has hue of 7.5YR, 5YR, and 2.5YR; value of 4 through 6; and chroma of 6 through 8. The B horizon is clay loam or clay.

Some pedons have a C horizon that is mixed brown, yellow, and red loam, silt loam, and clay loam.

Guernsey series

Soils of the Guernsey series are deep and moderately well drained. They formed in colluvium mostly from calcareous shale that is interbedded with lenses of limestone and sandstone. They are along drainageways and in upland depressional areas. Slopes range from 2 to 7 percent. The Guernsey soils in this survey area are a taxadjunct to the Guernsey series because they have a higher sand content in the IIB horizon than is defined for the range in the series. This difference does not significantly affect the use and management of the soils.

Guernsey soils are commonly near Chilhowie, Edom, Endcav, and Sequoia soils but have low-chroma mottles in the B horizon, which those soils do not have. Guernsey soils have more yellow in the subsoil than the Edom or Sequoia soils and a thicker solum than the Chilhowie soils.

Typical pedon of Guernsey silt loam, 2 to 7 percent slopes, 700 feet north of the entrance to Massanutten Caverns, 4/10 mile east of the intersection of State Routes 620 and 685:

Ap—0 to 10 inches, yellowish brown (10YR 5/4) silt loam; moderate fine granular structure; friable; common fine roots; common fine pores; medium acid; abrupt smooth boundary.

B1t—10 to 19 inches, yellowish brown (10YR 5/6) silty clay; many coarse faint light yellowish brown (10YR 6/4) mottles and few fine distinct yellowish red (5YR 5/8) mottles; weak fine subangular blocky structure; friable, sticky and slightly plastic; common fine and medium roots; common fine pores; few thin clay films; strongly acid; gradual smooth boundary.

B21t—19 to 26 inches, light yellowish brown (2.5YR 6/4) clay; common medium distinct yellowish brown (10YR 5/6), strong brown (7.5YR 5/8), and red (2.5YR 4/6) mottles and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; common fine pores; thin continuous clay films; neutral; clear smooth boundary.

IIB22t—26 to 33 inches, yellowish brown (10YR 5/8) sandy clay loam; weak moderate subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine pores; thin continuous yellowish brown (10YR 5/4) clay films; many coarse distinct light gray (N 7/0) clay flows in old root channels vertically and horizontally; neutral; gradual smooth boundary.

IIB23t—33 to 40 inches, yellowish brown (10YR 5/6) sandy clay loam; many coarse distinct light gray (10YR 7/1) and gray (10YR 6/1) mottles; weak thick platy structure parting to weak fine subangular blocky; firm, slightly sticky and plastic; many fine pores; common thin clay films; mildly alkaline; gradual smooth boundary.

IIB3t—40 to 60 inches, yellowish brown (10YR 5/6) clay loam; many coarse distinct gray (10YR 6/1) mottles and few medium distinct light yellowish brown (2.5YR 6/4) mottles; moderate medium angular blocky structure; firm, slightly sticky and slightly plastic; common fine pores; few thin clay films; few fine iron concretions; moderately alkaline.

The solum is 40 to 60 inches thick. The depth to bedrock is more than 5 feet. Shale and sandstone fragments up to 6 inches in diameter make up from 0 to about 15 percent of the A horizon and upper part of the B horizon and from 0 to 35 percent of the lower part of the B horizon.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 2 through 4.

The B horizon has hue of 10YR, 2.5Y, and 7.5YR; value of 4 through 6; and chroma of 4 through 6. Low-chroma mottles are in the upper 10 inches of the Bt horizon commonly at a depth of less than 19 inches.

Hawksbill series

Soils of the Hawksbill series are deep and well drained. They formed in alluvium derived from greenstone, sandstone, and phyllite. They are on low terraces and colluvial fans along the streams flowing out of the western foot slopes of the Blue Ridge Mountains. Slopes range from 2 to 15 percent.

Hawksbill soils commonly are near Craigsville, Unison, Fauquier, and Sylco soils and Typic Udorthents. Hawksbill soils have more clay than the Typic Udorthents or Craigsville soils, have more coarse fragments and less clay than the Unison or Fauquier soils, and have a higher base saturation than the Sylco soils.

Typical pedon of Hawksbill cobbly loam, 2 to 7 percent slopes, 1.6 miles north of the Elkton town center, about 100 yards east of U.S. Highway 340:

Ap—0 to 9 inches, dark brown (10YR 4/3) cobbly loam; moderate fine granular structure; friable; common fine roots; few very fine pores; common worm casts; 15 percent gravel and 10 percent cobblestones of greenstone, sandstone, and phyllite; medium acid; clear smooth boundary.

B21t—9 to 17 inches, dark brown (7.5YR 4/4) cobbly loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; thin patchy clay films; common worm casts; 25 percent gravel and 15 percent cobblestones of greenstone, sandstone, and phyllite; medium acid; gradual wavy boundary.

B22t—17 to 26 inches, dark brown (7.5YR 4/4) very cobbly clay loam; weak fine subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; common fine pores; thin patchy clay films; 25 percent gravel and 35 percent cobblestones of greenstone, sandstone, and phyllite; slightly acid; clear wavy boundary.

B3t—26 to 36 inches, dark brown (7.5YR 4/4) very gravelly clay loam; massive; friable; few fine roots; few thin patchy clay films; 55 percent gravel and 15 percent cobblestones of greenstone, sandstone, and phyllite; neutral; gradual smooth boundary.

C—36 to 60 inches, brown (10YR 4/3) very cobbly loam; massive; friable; few fine roots; 25 percent gravel and 35 percent cobblestones of greenstone, sandstone, and phyllite; neutral.

The solum thickness ranges from 20 to 40 inches. The depth to hard bedrock is more than 6 feet. The content of coarse fragments ranges from 20 to 70 percent in the Ap horizon, 35 to 70 percent in the upper part of the B horizon, and 50 to 70 percent in the lower part of the B horizon and in the C horizon. Some pedons have up to 15 percent of the surface covered with stones.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is cobbly loam or very cobbly loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. It is cobbly or very cobbly, gravelly or very gravelly analogues of clay loam or loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It has the same texture as the Bt horizon.

Laidig series

Soils of the Laidig series are deep and well drained. They have a fragipan at a depth of about 40 inches. The soils formed in colluvium from sandstone and shale. They are on side slopes and foot slopes of mountains. Slopes range from 2 to 55 percent.

Laidig soils are commonly near Berks, Buchanan, Monongahela, and Shelocta Variant soils. Laidig soils have a fragipan, which the Berks and Shelocta Variant soils do not have, and are better drained than the Buchanan or Monongahela soils.

Typical pedon of Laidig gravelly fine sandy loam in an area of Laidig very stony fine sandy loam, 25 to 45 percent slopes, 0.7 mile east of Virginia Highway 259 and 1-1/2 miles southeast of the intersection of Virginia Highway 259 and State Route 820:

O—3 inches to 1 inch, loose leaves and twigs.

O2—1 inch to 0, black (5YR 2/1) organic material.

A1—0 to 2 inches, dark grayish brown (10YR 4/2) gravelly fine sandy loam; weak fine granular structure; very friable; many fine roots; common fine pores; 30 percent angular sandstone and quartzite gravel; many stones; extremely acid; abrupt smooth boundary.

A2—2 to 6 inches, light brownish gray (10YR 6/2) gravelly fine sandy loam; weak fine granular structure; very friable; many fine roots; common fine pores; 30 percent angular sandstone and quartzite gravel; many stones; very strongly acid; abrupt smooth boundary.

B1t—6 to 15 inches, yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable; many fine and few medium roots; few fine pores; few thin clay films; 15 percent angular sandstone and quartzite gravel; strongly acid; clear smooth boundary.

B21t—15 to 23 inches, yellowish brown (10YR 5/4) cobbly clay loam; weak fine subangular blocky structure; friable; common fine medium and few large roots; few fine pores; few thin clay films; 30 percent angular sandstone and quartzite gravel and cobblestones; strongly acid; gradual wavy boundary.

B22t—23 to 35 inches dark, yellowish brown (10YR 4/4) cobbly clay loam; moderate fine subangular blocky structure; friable; few fine medium and large roots; few fine pores; thin continuous clay films; 30 percent angular sandstone and quartzite gravel and cobblestones; very strongly acid; gradual wavy boundary.

B3t—35 to 41 inches, yellowish brown (10YR 5/6) cobbly fine sandy loam; common fine distinct pale brown (10YR 6/3) and reddish yellow (7.5YR 6/8) mottles; weak fine subangular blocky structure; friable; few fine roots; few fine pores; few thin clay films; 35 percent angular sandstone and quartzite gravel and cobblestones; very strongly acid; gradual smooth boundary.

Bx—41 to 60 inches, yellowish brown (10YR 5/6) cobbly fine sandy loam; common medium faint pale brown (10YR 6/3) and brownish yellow (10YR 6/6) mottles; weak thick platy structure parting to moderate fine subangular blocky; firm and brittle; common fine and medium pores; 55 percent angular sandstone and quartzite gravel and cobblestones; strongly acid.

The thickness of the solum and the depth to bedrock are 60 inches or more. The depth to the fragipan is 30 to 50 inches. Sandstone pebbles and cobblestones make up from 10 to 35 percent of the A, B1, and B2 horizons and from 20 to 60 percent of the B3 and Bx horizons.

The A horizon has hue of 10YR, value of 4 through 6, and chroma of 2 through 8. It is fine sandy loam, gravelly fine sandy loam, and cobbly fine sandy loam.

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 through 8. It is fine sandy loam, loam, sandy clay loam, or clay loam or their cobbly and gravelly analogues.

The Bx horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 through 8. It is fine sandy loam, sandy clay loam, and clay loam and their gravelly, very gravelly, and cobbly analogues.

Lehew series

Soils of the Lehew series are moderately deep and well drained to excessively drained. They formed in the weathered products of interbedded reddish sandstone, siltstone, and shale. They are on mountain side slopes and mountaintops. Slopes range from 5 to 65 percent.

Lehew soils are commonly near Berks, Calvin, Dekalb, and Weikert soils. Lehew soils have more red in the solum than the Berks, Dekalb, or Weikert soils; have a

thicker solum than the Weikert soils; and have more sand and sandstone fragments and less shale throughout than the Calvin soils.

Typical pedon of Lehew cobbly fine sandy loam in an area of Lehew, Dekalb, and Calvin cobbly soils, 5 to 15 percent slopes, on Fulk Mountain, 1 mile east of Sand Spring:

Ap—0 to 7 inches; dark reddish brown (5YR 3/2) cobbly fine sandy loam; weak fine granular structure; friable; common fine roots; few fine pores; 15 percent sandstone fragments; medium acid; abrupt smooth boundary.

B1—7 to 15 inches; reddish brown (5YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; common fine pores; 10 percent sandstone and shale fragments up to 3 inches in length; strongly acid; clear wavy boundary.

B2—15 to 23 inches; reddish brown (5YR 4/3) very channery loam; weak fine subangular blocky structure; friable; few fine roots; few fine pores; 65 percent sandstone and shale fragments up to 3 inches in length; strongly acid; clear smooth boundary.

C—23 to 29 inches; reddish brown (5YR 4/3) very channery loam; massive; few fine roots; 90 percent weak red (2.5YR 4/2) shale fragments up to 6 inches in length; strongly acid.

R—29 inches; interbedded sandstone and shale.

The solum is 15 to 25 inches thick. The depth to bedrock is 20 to 40 inches. Sandstone and shale fragments up to 6 inches long make up from 10 to 25 percent of the A horizon and upper part of the B horizon, from 40 to 70 percent of the lower part of the B horizon, and from 60 to 90 percent of the C horizon.

The Ap horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. The B and C horizons have hue of 5YR, value of 4 or 5, and chroma of 3 or 4. The B2 and C horizons are very channery loam, channery loam, channery fine sandy loam, or very channery fine sandy loam.

Lodi series

Soils of the Lodi series are deep and well drained. They formed in weathered limestone or interbedded limestone and sandstone and are on uplands. Slopes range from 2 to 45 percent.

Lodi soils are commonly near the Frederick, Endcav, Edom, and Timberville Variant soils. Lodi soils have a thinner solum than the Frederick soils, more red in the subsoil than the Endcav soils, and lower base saturation than the Edom soils. Lodi soils do not have the shale fragments typical of the Edom soils. The Timberville Variant soils formed in alluvial material.

Typical pedon of Lodi silt loam in an area of Frederick and Lodi silt loams, 7 to 15 percent slopes, eroded, 1 mile south of Harrisonburg, 0.7 mile southwest of Interstate 81 and State Route 710 and 650 feet southeast of the pedestrian tunnel under Interstate 81:

Ap—0 to 7 inches, dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; common fine roots; 10 percent chert up to 2 inches in length; slightly acid; abrupt smooth boundary.

B21t—7 to 11 inches, strong brown (7.5YR 5/6) silty clay loam; common medium faint yellowish brown (10YR 5/4) mottles; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine pores; thin continuous clay films; 2 percent black oxide stains up to 2 millimeters in diameter; 2 percent chert up to 1 inch in length; medium acid; clear smooth boundary.

B22t—11 to 18 inches, yellowish red (5YR 4/6) clay; common medium faint strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; very strongly acid; gradual smooth boundary.

B23t—18 to 26 inches, yellowish red (5YR 4/6) clay; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium blocky structure; firm, sticky and plastic; few very fine roots; few fine pores; thin continuous clay films; very strongly acid; gradual wavy boundary.

B24t—26 to 41 inches, yellowish red (5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/4) mottles and few medium distinct light olive brown (2.5YR 5/4) mottles; moderate fine blocky structure; firm, sticky and plastic; few very fine roots; few very fine pores; thin continuous clay films; 10 percent chert up to 6 inches in length; very strongly acid; gradual wavy boundary.

B3t—41 to 60 inches, yellowish red (5YR 4/6) cherty clay; many coarse distinct yellowish brown (10YR 5/6) mottles; weak medium blocky structure; firm, slightly sticky and slightly plastic; few very fine roots; few very fine pores; thin continuous clay films; 15 percent chert up to 5 inches in length; very strongly acid; abrupt wavy boundary.

C—60 to 72 inches, brownish yellow (10YR 6/6) silty clay; many coarse distinct red (2.5YR 4/6) mottles and few fine distinct light olive brown (2.5YR 5/4) mottles; massive; friable; small pockets and streaks of red (2.5YR 4/6) clay; very strongly acid.

The solum thickness is 40 to 80 inches. The depth to bedrock is 6 feet or more. Fragments of chert and sandstone make up 0 to 25 percent of the solum, and the A horizon is up to 60 percent chert.

The A horizon has hue of 10YR to 5YR, value of 4 through 6, and chroma of 2 through 6. It is silt loam and

fine sandy loam and the cherty and very cherty analogues of these textures.

The B horizon has hue of 7.5YR, 5YR, and 2.5YR and has value and chroma of 4 through 6. It is silty clay loam, clay loam, silty clay, or clay.

The C horizon has hue of 10YR, 7.5YR, and 5YR, value of 4 through 6, and chroma of 4 through 8. It is sandy clay loam, clay loam, loam, and silty clay loam.

The Lodi soils in this survey area are mapped only with Frederick soils.

Massanetta series

Soils of the Massanetta series are deep and moderately well drained. They formed in alluvium from soils weathered from limestone and calcareous shale. They are on small, narrow flood plains mainly near large springs flowing from limestone bedrock. Slopes range from 0 to 2 percent.

Massanetta soils commonly are near Aquic Udifluvents and Timberville Variant, Frederick, and Berks soils. None of those soils has the mollic epipedon or secondary lime concretions typical of the Massanetta soils. Massanetta soils have more gray in the subsoil than the Aquic Udifluvents or the Timberville Variant or Frederick soils, and have fewer coarse fragments than the Berks soils.

Typical pedon of Massanetta silt loam, 0 to 2 percent slopes, 800 feet southwest of the intersection of State Routes 696 and 727:

Ap—0 to 11 inches, very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable; common fine roots; 5 percent secondary lime concretions up to 2 millimeters in diameter; strong effervescence; mildly alkaline; clear smooth boundary.

B1—11 to 16 inches, dark gray (10YR 4/1) clay loam; moderate medium granular structure; friable; few fine roots; 10 percent secondary lime and shell fragments up to 12 millimeters in diameter; commmon worm casts and channels strong effervescence; mildly alkaline; clear smooth boundary.

B2—16 to 25 inches, gray (10YR 5/1) clay loam; moderate fine granular structure; very friable; few fine roots; 10 percent secondary lime and shell fragments up to 5 millimeters in diameter; yellowish brown (10YR 5/8) worm casts and soil material filling old root channels; strong effervescence; moderately alkaline; gradual smooth boundary.

C1—25 to 35 inches, dark gray (10YR 4/1) loam; massive; very friable; few fine roots; 20 percent secondary lime and shell fragments up to 12 millimeters in diameter; strong effervescence; moderately alkaline; clear smooth boundary.

C2—35 to 54 inches, gray (10YR 5/1) loam; massive; very friable; 25 percent secondary lime and shell fragments up to 12 millimeters in diameter; yellowish brown (10YR 5/6) coatings along root channels; strong effervescence; moderately alkaline; clear smooth boundary.

C3—54 to 64 inches, light gray (10YR 6/1) silt loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles; massive; 20 percent secondary lime and shell fragments less than 1 millimeter in diameter; strong effervescence; mildly alkaline; abrupt smooth boundary.

IIC4—64 to 80 inches, yellowish brown (10YR 5/8) clay; many medium distinct dark gray (10YR 4/1) mottles; massive; 4 percent secondary lime concretions less than 1 millimeter in diameter; strong effervescence; mildly alkaline.

The solum thickness ranges from 20 to 40 inches. The depth to bedrock is more than 5 feet. Coarse fragments, consisting of secondary lime concretions and shells, make up 0 to 10 percent of the solum and 0 to 30 percent of the substratum.

The A horizon has hue of 10YR, value of 3, and chroma of 1 through 3.

The B horizon has hue of 10YR, value of 3 through 6, and chroma of 1 through 2. It is silt loam, loam, silty clay loam, or clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 2 through 5, and chroma of 0 through 2. The C horizon is silt loam, loam, clay loam, silty clay loam, or their gravelly analogues.

The IIC horizon is variable in texture and is stratified in some pedons. In some pedons, stratified tufa or sand and gravel are at a depth of more than 30 inches.

Millrock series

Soils of the Millrock series are deep and well drained. They formed in alluvium from sandstone and limestone. They are on flood plains of the major streams and rivers. Slopes range from 0 to 4 percent.

Millrock soils commonly are near the Buckton, Chavies, Wheeling, Tioga, and Craigsville soils. Millrock soils are more sandy than any of those soils. Millrock soils do not have the free carbonates throughout the solum typical of the Buckton soils, do not have the argillic horizons typical of the Chavies and Wheeling soils, and do not have the cambic B horizon typical of the Tioga and Craigsville soils. Millrock soils have fewer coarse fragments in the control section than the Craigsville soils.

Typical pedon of Millrock loamy sand, 0 to 4 percent slopes, 1.9 miles southeast of Mount Crawford, 100 feet north of North River, and 1,300 feet west of the CW Railroad bridge:

Ap—0 to 6 inches, dark brown (7.5YR 3/2) loamy sand; single grain; loose; many fine and few medium roots; slightly acid; abrupt smooth boundary.
B—6 to 14 inches, brown (7.5YR 4/4) loamy sand; single grain; loose; many fine and few medium roots; slightly acid; abrupt smooth boundary.
A1b—14 to 26 inches, dark brown (7.5YR 3/2) loamy sand; single grain; loose; few fine and medium roots; irregular strata of brown (7.5YR 4/4) loamy sand; slightly acid; abrupt smooth boundary.
A2b—26 to 40 inches, brown (7.5YR 4/4) loamy sand; single grain; loose; few fine and medium roots; slightly acid; clear wavy boundary.
A2b and Bt—40 to 60 inches, brown (7.5YR 4/4) loamy sand; thin reddish brown (5YR 4/3) fine sandy loam lamellae; A2b material is single grain and loose; thin Bt lamella have weak fine subangular blocky structure; very friable; thin clay bridging between sand grains evident in lamellae; slightly acid.

The solum thickness ranges from 30 to 60 inches. The depth to bedrock is more than 6 feet. The content of coarse fragments, mainly sandstone gravel, ranges from 0 to 10 percent above a depth of 6 inches and from 0 to 20 percent at a depth of 6 to 40 inches. Below 40 inches, the content of sandstone gravel and cobblestones ranges from 0 to 50 percent.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 through 4. It is loamy fine sand or loamy sand.

The B horizon has hue of 7.5YR or 10YR, value of 4, and chroma of 3 or 4. It is loamy fine sand or loamy sand. Some pedons have a C horizon with hue, value, and chroma similar to those of the B horizon, and that is loamy sand or its gravelly, very gravelly, cobbly, and very cobbly analogues. The B and C horizons have lamellae of fine sandy loam with a combined thickness in the upper 60 inches of less than 6 inches.

Monongahela series

Soils of the Monongahela series are deep and moderately well drained and have a fragipan. The soils formed in old alluvium derived largely from acid sandstone and shale. The Monongahela soils are on terraces along the major streams and rivers. Slopes range from 0 to 15 percent.

Monongahela soils are commonly near the Allegheny, Purdy, Cotaco, and Buchanan soils. The Allegheny, Purdy, and Cotaco soils do not have a fragipan. Monongahela soils are better drained than the Purdy or Buchanan soils, and are not as well drained as the Allegheny soils.

Typical pedon of Monongahela fine sandy loam, 0 to 7 percent slopes, 800 feet southeast of intersection of Highways 659 and 655, 1.5 miles northeast of Port Republic:

Ap—0 to 10 inches, brown to dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; common fine roots; few fine pores; common worm casts and channels; neutral; abrupt smooth boundary.
B1t—10 to 18 inches, pale brown (10YR 6/3) loam; weak fine subangular blocky structure; friable; few fine roots; many fine pores; common worm casts and channels; light yellowish brown (10YR 6/4) stains on some ped faces; neutral; abrupt smooth boundary.
B2t—18 to 24 inches, yellowish brown (10YR 5/6) loam; few fine distinct light gray (10YR 7/2) and strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable; few fine roots; common fine pores; thin continuous clay films; few worm channels and casts; 1 percent rounded quartzite fragments up to 1/8 inch in diameter; neutral; abrupt smooth boundary.
Bx1—24 to 33 inches, pale brown (10YR 6/3) loam; common medium faint yellowish brown (10YR 5/6) and light gray (10YR 7/2) mottles; moderate thick platy structure parting to moderate fine subangular blocky; very firm, brittle; common fine and medium pores; very strongly acid; abrupt wavy boundary.
B22t—33 to 42 inches, strong brown (7.5YR 5/6) loam; common medium distinct light gray (10YR 7/2) and red (2.5YR 5/8) mottles; moderate fine subangular blocky structure; friable; common fine and medium thin continuous yellowish red (5YR 4/8) clay films; very strongly acid; gradual wavy boundary.
IIB23t—42 to 50 inches, yellowish red (5YR 5/6) clay loam; common medium distinct yellow (10YR 7/8) and pale brown (10YR 6/3) mottles; moderate fine subangular blocky structure; friable; few fine pores; thin continuous strong brown (7.5YR 5/6) clay films; very strongly acid; gradual wavy boundary.
IIB24t—50 to 60 inches, red (2.5YR 5/6) clay; moderate fine subangular blocky structure; friable; few fine pores; thin continuous brown (10YR 4/3) clay films; very strongly acid.

The solum is 40 inches to more than 60 inches thick. The depth to bedrock is more than 5 feet. The depth to the fragipan ranges from 20 to 30 inches.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It ranges from loam to cobbly fine sandy loam.

The Bt horizon has hue of 10YR, value of 4 or 5, and chroma of 3 through 8. It is clay loam, sandy clay loam, or loam.

The Bx horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 through 6. Mottles are common or many. The Bx horizon is fine sandy loam, loam, clay loam, or sandy clay loam.

Some pedons have a IIBt horizon with hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 6 or 8. It is loam, clay loam, or clay.

Some pedons have a C horizon, with hue of 10YR or 7.5YR, value of 5, and chroma of 4 through 6. It is clay loam or clay or the gravelly and cobbly analogues. Some pedons are underlain by stratified sand, silt, pebbles, or cobblestones.

Myersville series

Soils of the Myersville series are deep and well drained. They formed in residuum weathered from greenstone. The Myersville soils are on the ridgetops and side slopes of the Blue Ridge Mountains. Slopes range from 7 to 60 percent.

The Myersville soils in this survey area are a taxadjunct to the Myersville series. They have a slightly higher base saturation than is defined in the range for the series. This difference does not significantly affect the use and management of the soils.

Myersville soils are commonly near Sylco and Fauquier soils. Myersville soils are deeper to bedrock and have more clay and fewer coarse fragments in the subsoil than the Sylco soils. Myersville soils are not as red in the subsoil as the Fauquier soils and have less clay.

Typical pedon of Myersville silt loam in an area of Myersville very stony silt loam, 7 to 15 percent slopes, in Skyline Park, 1.2 miles southeast of Beldor:

Ap—0 to 5 inches, dark brown (7.5YR 4/4) silt loam; moderate fine granular structure; friable; many fine roots; few fine pores; 5 percent angular greenstone fragments up to 3 inches in diameter; slightly acid; abrupt smooth boundary.

B1t—5 to 11 inches, strong brown (7.5YR 5/6) silt loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; few thin clay films; common worm casts; 15 percent angular greenstone fragments up to 6 inches in diameter; medium acid; clear smooth boundary.

B2t—11 to 21 inches, strong brown (7.5YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable, slightly sticky and plastic; few fine roots; many fine pores; thin continuous clay films; few worm casts; 15 percent angular greenstone fragments up to 12 inches in diameter; medium acid; gradual wavy boundary.

B3t—21 to 30 inches, strong brown (7.5YR 5/6) cobbly silty clay loam; few fine and medium distinct yellowish red (5YR 4/6) mottles; weak fine subangular blocky structure; friable; few fine roots; few thin clay films; common black oxide concretions and stains; 35 percent angular greenstone fragments up to 15 inches in diameter; medium acid; gradual wavy boundary.

C—30 to 44 inches, strong brown (7.5YR 5/6), brownish yellow (10YR 6/6), and yellowish red (5YR 5/6) very cobbly silt loam; massive; few fine roots; common black oxide concretions and stains; 60 percent angular greenstone fragments up to 18 inches in diameter; pockets of weak fine subangular blocky light clay loam with few thin clay films; medium acid.

R—44 inches, weathered greenstone.

The solum is 20 to 40 inches thick. The depth to bedrock is more than 3-1/2 feet. Rock fragments, cobblestones, and flagstones of greenstone make up from 5 to 30 percent of the surface layer, 10 to about 35 percent of the subsoil, and 5 to 70 percent of the substratum.

The A horizon has hue of 7.5YR and 10YR, value of 4, and chroma of 3 or 4.

The B horizon has hue of 7.5YR and 10YR, value of 5, and chroma of 6 through 8. It is loam, silt loam, clay loam, or silty clay loam, and their cobbly analogues.

The C horizon has 7.5YR, 10YR, and 5YR; value of 5 or 6, and chroma of 6 through 8. It is silt loam, loam, or their cobbly analogues.

Nixa series

Soils of the Nixa series are deep and moderately well drained and have a fragipan. They formed in local colluvial material derived from cherty limestone. The Nixa soils are at the base of and along the lower slopes of cherty knolls and ridges. Their slopes range from 2 to 15 percent. The Nixa soils in this survey area are a taxadjunct to the Nixa series because they are mottled in the A horizon and have less chert in the B2 horizon and a wider range in value and chroma than is defined in the range for the series.

Nixa soils commonly are near the Frederick and Lodi soils. The Frederick and Lodi soils have a red, clayey subsoil not typical of the Nixa soils and do not have a fragipan.

Typical pedon of Nixa cherty silt loam, in an area of Nixa-Frederick-Lodi cherty silt loams, 7 to 15 percent slopes, 1.3 miles west of Bridgewater, 900 feet southeast of the North River, and 1,800 feet north of Route 727:

A1—0 to 2 inches, very dark gray (10YR 3/1) cherty silt loam; weak fine granular structure; friable; many fine roots; few fine pores; 25 percent chert fragments up to 3 inches in diameter; few chert fragments up to 6 inches in diameter; strongly acid; abrupt smooth boundary.

A21—2 to 11 inches, light yellowish brown (10YR 6/4) cherty silt loam; common fine and medium distinct yellowish brown (10YR 5/4), light gray (10YR 7/2), and very pale brown (10YR 7/3) mottles; weak fine granular structure; friable; common fine medium and coarse roots; many fine and medium pores; 20 percent chert fragments up to 2 inches in diameter; strongly acid; clear wavy boundary.

A22—11 to 16 inches, light yellowish brown (10YR 6/4) cherty silt loam; common medium distinct yellowish brown (10YR 5/4), light gray (10YR 7/2), and dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable, slightly sticky; few fine roots; many fine and medium pores; 35 to 40 percent chert fragments up to 2 inches in diameter; few chert fragments up to 5 inches in diameter; very strongly acid; clear smooth boundary.

Bx—16 to 39 inches, light gray (10YR 7/1) very cherty silt loam; many medium and coarse distinct light gray (N 7/0), pale brown (10YR 6/3), and yellowish brown (10YR 5/4) mottles; massive; very firm, brittle; 60 percent chert fragments up to 2 inches in diameter; very strongly acid; clear smooth boundary.

B2t—39 to 45 inches, brown (7.5YR 4/4) cherty clay loam; many distinct light gray (10YR 7/1) mottles; weak fine subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; few fine pores; thin patchy clay films; 35 to 40 percent chert fragments up to 2 inches in diameter; very strongly acid; abrupt smooth boundary.

B3—45 to 60 inches, yellowish brown (10YR 5/6) and light gray (10YR 7/1) cherty heavy silt loam; common medium distinct dark brown (7.5YR 4/4) mottles; weak fine subangular blocky structure; firm; 35 to 40 percent chert fragments up to 2 inches in diameter; very strongly acid.

The solum thickness is 40 to 60 inches or more. The depth to bedrock is more than 6 feet. The depth to the fragipan ranges from 15 to 24 inches. Chert fragments make up 20 to 50 percent of the surface layer and 35 to 70 percent of the subsoil and fragipan.

The A horizon has hue of 10YR, value of 3 through 6, and chroma of 1 through 4.

The Bx horizon has hue of 10YR, value of 5 through 7, and chroma of 1 through 8. It is cherty silt loam or very cherty silt loam. The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 8. The B horizon is cherty silt loam, cherty clay loam, very cherty silt loam, or very cherty clay loam.

Purdy series

Soils of the Purdy series are deep and poorly drained. They formed in clayey alluvium from sandstone, shale, and limestone. They are around the heads of drainageways and along drainageways on terraces. Slopes are 0 to 2 percent.

Purdy soils are commonly near and more poorly drained than the Buchanan, Laidig, Millrock, and Monongahela soils.

Typical pedon of Purdy silt loam, 0 to 2 percent slopes, 6/10 mile east of Timberville and 400 feet northwest of intersection of State Highway 260 and State Route 618:

Ap—0 to 7 inches; grayish brown (2.5Y 5/2) silt loam; moderate fine subangular blocky structure; friable; common fine roots; common very fine pores; strongly acid; clear smooth boundary.

B1tg—7 to 12 inches; grayish brown (10YR 5/2) silty clay loam; common fine faint dark yellowish brown (10YR 4/4) mottles; moderate fine subangular blocky structure; friable, slightly sticky and nonplastic; few fine roots; common very fine pores; few thin clay films; medium acid; abrupt smooth boundary.

B21tg—12 to 21 inches; gray (10YR 5/1) clay loam; few medium distinct yellowish brown (10YR 5/6) mottles, common medium faint light gray (10YR 7/1) mottles, and common medium distinct gray (N 5/0) mottles; moderate fine subangular blocky structure; firm, sticky and plastic; few very fine roots; thin continuous clay films; medium acid; clear smooth boundary.

B22tg—21 to 36 inches; gray (N 5/0) clay; common fine and medium distinct brownish yellow (10YR 6/6) and light gray (10YR 7/1) mottles; moderate coarse angular blocky structure; firm, sticky and plastic; few fine roots; few very fine pores; thin continuous clay films; very strongly acid; gradual wavy boundary.

Cg—36 to 60 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/6) mottles; massive; firm, sticky and plastic; very strongly acid.

The solum is 28 to 48 inches thick. The depth to bedrock is more than 5 feet.

The A horizon has hue of 2.5Y and 10YR, value of 4 or 5, and chroma of 1 or 2.

The B horizon is neutral or has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 0 through 2.

The C horizon is neutral or has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 0 through 2. In some pedons, the C horizon is stratified sand, gravel, and cobblestones.

Sequoia series

Soils of the Sequoia series are deep and well drained. They formed in residuum weathered from shale. The Sequoia soils are on ridgetops, knolls, and side slopes of uplands. Slopes range from 2 to 25 percent. The Sequoia soils in this survey area are a taxadjunct to the Sequoia series because they do not have a Cr horizon and have a lower color value in the B2 horizon and less silt in the B3 horizon than defined in the range for the series. These differences do not significantly affect the use and management of the soils.

Sequoia soils are commonly near Berks, Guernsey, Laidig, and Weikert soils. Sequoia soils have a thicker solum than the Berks or Weikert soils and are better drained and more acid in the lower part of the subsoil than the Guernsey soils. Berks soils have an argillic horizon not typical of any of the nearby soils and do not have the fragipan typical of the Laidig soils.

Typical pedon of Sequoia silt loam, 2 to 7 percent slopes, eroded, 3 miles northeast of Weyers Cave, 2/3 mile east of the junction of State Routes 276 and 678, and 100 feet south of the junction of State Routes 678 and 677:

Ap—0 to 9 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable; common fine and very fine roots; common very fine pores; few worm casts and channels; 3 percent weathered shale fragments up to 1 inch across; neutral; abrupt smooth boundary.

B2t—9 to 24 inches; yellowish red (5YR 4/6) clay; strong fine and medium subangular blocky structure; firm, sticky and plastic; few fine roots; common very fine pores; thin continuous clay films; 50 percent yellowish brown (10YR 5/4) coatings on ped faces; 2 percent shale fragments up to 2 inches across; strongly acid; gradual wavy boundary.

B3t—24 to 36 inches; yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) shaly clay loam; common medium distinct red (2.5YR 4/8) and white (2.5Y 8/2) mottles; weak fine subangular blocky structure; firm, sticky and plastic; few fine and very fine roots; common very fine pores; few thin clay films; some ped faces have yellowish brown (10YR 5/4) coatings; 15 percent weathered shale fragments up to 4 inches across; vertical ledge of shale 3 inches wide; very strongly acid; gradual wavy boundary.

C—36 to 60 inches; brownish yellow (10YR 6/6) very shaly clay loam; common coarse distinct red (2.5YR 5/8) and light gray (2.5Y 7/2) mottles; massive; friable; few fine roots; few very fine pores; 60 percent weathered shale fragments; very strongly acid.

The solum is 20 to 40 inches thick. The depth to hard shale is commonly more than 5 feet. Shale fragments up to 4 inches long make up 2 to 20 percent of the solum.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is silt loam or loam and their stony phases.

The B2 horizon has hue of 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 through 8. The B3 horizon is clay or clay loam.

The C horizon has the same hue, value, and chroma as the B horizon. The C horizon is clay loam or silty clay loam or their shaly or very shaly analogues.

Shelocta Variant

Soils of the Shelocta Variant are deep and well drained. They formed in the weathered residuum of colluvial material from acid shale, siltstone, and sandstone. The Shelocta Variant soils are on concave, lower mountain foot slopes. Slopes range from 2 to 15 percent.

Shelocta Variant soils are commonly near the Laidig, Buchanan, Sequoia, and Berks soils. Shelocta Variant soils are finer textured than and do not have the fragipan typical of the Laidig and Buchanan soils, and they are deeper to bedrock than the Sequoia or Berks soils.

Typical pedon of Shelocta Variant loam in an area of Shelocta Variant very stony loam, 5 to 15 percent slopes, 1.75 miles northeast of Keezletown, 0.2 mile southeast of Route 758, 1 mile east of the intersection of Routes 758 and 620:

O1—5 to 2 inches, loose leaves and twigs.

O2—2 inches to 0, very dark brown (10YR 2/2) organic matter.

A1—0 to 7 inches, dark brown (10YR 3/3) loam; weak fine granular structure; friable; many fine and medium roots, few coarse roots; 30 percent sandstone fragments; strongly acid; clear smooth boundary.

B1t—7 to 13 inches, light yellowish brown (2.5YR 6/5) loam; common medium faint brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots, few coarse roots; thin patchy clay films; 12 percent sandstone fragments up to 8 inches across; many fine and very fine pores; strongly acid; gradual wavy boundary.

B21t—13 to 22 inches, light yellowish brown (2.5Y 6/4) and brownish yellow (10YR 6/8) loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common fine roots; thin continuous clay films; 12 percent sandstone fragments up to 8 inches across; few fine pores; strongly acid; gradual smooth boundary.

B22t—22 to 34 inches, brownish yellow (10YR 6/6) clay; common fine distinct red (2.5YR 4/8) mottles; moderate fine blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; 20 percent sandstone fragments up to 12 inches across; medium acid; gradual smooth boundary.

B23t—34 to 45 inches, brownish yellow (10YR 6/6) clay; many coarse distinct red (2.5YR 4/8) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable, slightly sticky, plastic; few fine and very fine roots; few fine pores; thin continuous clay films; 10 percent sandstone fragments up to 5 inches across; medium acid; clear smooth boundary.

B3t—45 to 54 inches; brownish yellow (10YR 6/8) clay loam; many coarse distinct red (2.5YR 4/8) and white (2.5Y 8/0) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; thin patchy clay films; 15 percent sandstone fragments up to 6 inches across; 2 percent highly weathered shale fragments up to 1 inch across; medium acid; clear smooth boundary.

C—54 to 60 inches, red (2.5YR 4/8), white (2.5Y 8/0), and brownish yellow (10YR 6/8) very cobbly clay loam; massive; 70 percent sandstone fragments up to 6 inches across.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 5 feet. Coarse fragments range from 3 to 15 inches in diameter and comprise 5 to 35 percent of the solum and 30 to 70 percent of the C horizon.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 2 through 8.

The B horizon has hue of 2.5Y through 10YR, value of 4 through 6, and chroma of 4 through 8. It ranges from silt loam to clay loam in the upper part and is clay loam or clay in the lower part.

The C horizon is neutral or has hue of 2.5Y through 2.5YR, value of 4 through 8, and chroma of 0 through 8. It is cobbly or very cobbly clay loam.

Shenval series

Soils of the Shenval series are deep and well drained. They formed in alluvium from limestone, shale, and some sandstone. Shenval soils are on broad terraces along large streams. Slopes range from 2 to 25 percent.

Shenval soils commonly are near Frederick, Edom, Allegheny, and Monongahela soils. Shenval soils have manganese concretions that are not typical of the Frederick soils and have more sandstone than the Edom soils and do not have the shale fragments typical of the Edom soils. They have more red in the subsoil than the Allegheny soils and are better drained than and do not have the fragipan typical of the Monongahela soils.

Typical pedon of Shenval loam, 7 to 15 percent slopes, eroded; 2-1/2 miles west of New Market, 1,600 feet south of the intersection of U.S. Highway 260 and a farm lane and 900 feet northwest of Hertzler Spring:

Ap—0 to 7 inches, dark brown (7.5Y 4/4) loam; moderate fine granular structure; friable; many fine roots; 3 percent oxide concretions up to 2 millimeters in diameter; less than 2 percent sandstone cobblestones; few worm channels and casts; neutral; abrupt smooth boundary.

B21tg—7 to 17 inches, yellowish red (5YR 4/6) clay loam; moderate fine subangular blocky structure; friable, sticky, plastic; few fine roots; few fine pores; thin continuous clay films; 10 percent oxide concretions up to 1 inch in diameter; less than 5 percent sandstone cobblestones; medium acid; clear smooth boundary.

B22t—17 to 35 inches, yellowish red (5YR 4/6) clay; moderate fine subangular blocky structure; friable, sticky, plastic; few very fine roots; few fine pores; thin continuous clay films; 20 percent oxide concretions up to 1 inch in diameter; 5 percent sandstone cobblestones; strongly acid; gradual wavy boundary.

IIB23t—35 to 85 inches, yellowish red (5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/6) mottles; strong fine blocky structure; friable, sticky, plastic; thin continuous clay films; 1 percent quartz and chert fragments up to 1 inch in diameter; strongly acid.

The solum thickness is more than 60 inches. The depth to hard bedrock, commonly limestone, is more than 6 feet. The content of coarse fragments ranges from 0 to 30 percent in the surface layer and 0 to 20 percent in the subsoil. The content of oxide concretions ranges from 2 to 25 percent and commonly increases with depth. Reaction in unlimed areas ranges from strongly acid to medium acid in the surface layer and in the subsoil.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 through 6. It is loam, silt loam, and fine sandy loam and their gravelly and cobbly analogues.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 through 6, and chroma of 4 through 8. It is clay loam or clay.

Some pedons have a C horizon that is mixed red, brown, yellow, and olive and that ranges from sandy loam to clay or their gravelly analogues.

Sherando series

Soils of the Sherando series are deep and well drained to somewhat excessively drained. They formed in alluvium and colluvium and are on the fans, foot slopes, and benches of mountainous uplands. Slopes range from 7 to 35 percent.

Sherando soils are commonly near Allegheny, Craigsville, Laidig, and Monongahela soils. Sherando soils have a higher content of coarse fragments than the Allegheny, Laidig, or Monongahela soils; do not have the argillic horizon typical of the Allegheny soils; are not as red in the subsoil as the Craigsville soils and are at a higher landscape position; and do not have the fragipan typical of the Laidig and Monongahela soils.

Typical pedon of Sherando cobbly sandy loam, 7 to 15 percent slopes, 3/4 mile southwest of Berrytown, 200 feet east of State Route 754:

O1—3 inches to 1 inch, loose leaves and twigs.
O2—1 inch to 0, black (5YR 2/1) organic material of partly decayed leaves and twigs.
A1—0 to 1 inch, dark brown (10YR 4/3) cobbly sandy loam; weak fine granular structure; friable; common fine roots; few medium roots; few fine pores; 25 percent angular sandstone cobblestones; medium acid; abrupt smooth boundary.
A2—1 to 12 inches, yellowish brown (10YR 5/4) cobbly sandy loam; weak fine granular structure; very friable; common fine roots; few medium and coarse roots; few fine pores; 45 percent angular and rounded sandstone cobblestones and gravel; medium acid; gradual wavy boundary.
B—12 to 33 inches, strong brown (7.5YR 5/6) very cobbly sandy loam; weak fine subangular blocky structure; very friable; common fine and medium roots, few coarse roots; common fine pores; 70 percent angular and rounded sandstone cobblestones and gravel; strongly acid; clear wavy boundary.
C—33 to 60 inches, brownish yellow (10YR 6/6) very cobbly loamy sand; single grain; loose; few fine roots; few fine pores; 60 percent angular and rounded sandstone cobblestones and gravel; very strongly acid.

The solum is 30 to 60 inches thick. The depth to bedrock is more than 6 feet. Angular and rounded sandstone and quartzite cobblestones and gravel make up from 20 to 40 percent of the A horizon, and from 35 to 80 percent of the subsoil and substratum.

The A1 horizon has hue of 10YR, value of 4, and chroma of 2 through 4.

The B horizon has hue of 7.5YR and 10YR, value of 5, and chroma of 4 through 8.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 4 through 8. It is very cobbly sandy loam or loamy sand.

Swimley series

Soils of the Swimley series are deep and well drained. They formed in residuum weathered from limestone. The Swimley soils are on uplands of the Great Limestone Valley. Slopes range from 2 to 15 percent. The Swimley soils in this survey area are a taxadjunct to the Swimley series because the subsoil is a darker red than defined in the range for the series. This difference does not significantly affect the use and management of the soils.

Swimley soils are commonly near the Frederick, Lodi, Endcav, and Timberville Variant soils. Swimley soils have more red in the subsoil than any of those soils and have higher base saturation than the Timberville Variant soils.

Typical pedon of Swimley silty clay loam, 2 to 7 percent slopes, eroded, 600 feet north of State Route 805, 1,600 feet north of the intersection of State Routes 805 and 721:

Ap—0 to 7 inches, dark brown (7.5YR 3/2) silty clay loam; moderate medium granular structure; friable; common fine and medium roots; few very fine pores; few limestone channer fragments; common worm channels and casts; neutral; abrupt smooth boundary.
B21t—7 to 11 inches; dark reddish brown (2.5YR 3/4) silty clay; weak fine subangular blocky structure; friable, sticky and plastic; common fine and very fine roots; common fine and very fine pores; thin continuous clay films; few oxide stains; few limestone channer fragments; neutral; gradual smooth boundary.
B22t—11 to 28 inches; dark reddish brown (2.5YR 3/4) clay; strong medium subangular blocky structure; firm, sticky and plastic; few fine and medium roots; few fine pores; moderately thick continuous clay films; few oxide concretions and stains; few channer fragments; neutral; gradual smooth boundary.
B23t—28 to 60 inches, dark reddish brown (2.5YR 3/4) clay; pockets of yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; friable, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; common oxide concretions and stains; medium acid.

The solum thickness is more than 60 inches. The depth to bedrock is more than 6 feet. The content of coarse fragments, mainly manganese and iron concretions and some chert, ranges from 0 to 10 percent.

The A horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 through 4.

The Bt horizon has hue of 2.5YR, value of 3 or 4, and chroma of 4 through 8.

Sylco series

Soils of the Sylco series are moderately deep and well drained. They have formed in residuum weathered from interbedded shale, slate, siltstone, and phyllite. The Sylco soils are on mountain side slopes along the western flank of the Blue Ridge Mountains. Slopes are 15 to 60 percent. The Sylco soils in this survey area are a taxadjunct to the Sylco series because the mean

annual rainfall is lower than that defined in the range for the series. This difference does not significantly affect the use and mangement of the soils.

Sylco soils are commonly near Drall, Laidig, Fauquier, and Hawksbill soils. Sylco soils have less sand and fewer stones than the Drall soils; do not have the fragipan typical of the Laidig soils; have more coarse fragments, less clay, and are more brown than the Fauquier soils; and have fewer cobblestones and more flagstones than the Hawksbill soils and are not so deep to bedrock.

Typical pedon of Sylco flaggy silt loam in an area of Sylco very stony silt loam, 25 to 60 percent slopes, about 0.7 mile southwest of Beldor in a forest about 200 feet northwest of Route 628:

O2—1 inch to 0, black (10YR 2/1) organic material of partially decayed leaves, roots, and twigs.
A1—0 to 1 inch, dark grayish brown (10YR 4/2) flaggy silt loam; weak fine granular structure; very friable; many fine roots; 30 percent flagstones; many stones; strongly acid; abrupt smooth boundary.
A2—1 to 8 inches, yellowish brown (10YR 5/6) flaggy silt loam; weak fine granular structure; friable; many fine and few medium roots; 30 percent flagstones; very strongly acid; clear smooth boundary.
B2—8 to 23 inches, yellowish brown (10YR 5/8) flaggy silt loam; moderate fine subangular blocky structure; friable; common fine and few medium and coarse roots; many very fine pores; few thin patchy clay films; 20 percent flagstones; very strongly acid; gradual wavy boundary.
C—23 to 34 inches, yellowish brown (10YR 5/8) very channery silt loam; 80 percent channer fragments and flagstones; few fine roots; very strongly acid.
R—34 inches, siltstone and phyllite bedrock.

The solum thickness ranges from 20 to 30 inches. The depth to bedrock ranges from 20 to 40 inches. The content of coarse fragments ranges from 20 to 40 percent in the solum and from 50 to 80 percent in the substratum. Stones cover 0 to 15 percent of the soil surface.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 6. It is channery or flaggy analogues of silt loam or loam.

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 through 8. It is channery or very channery, flaggy or very flaggy analogues of silt loam or loam.

The C horizon has the same texture, hue, value, and chroma as the B horizon.

Timberville Variant

Soils of the Timberville Variant are deep and well drained. They formed in alluvium derived from limestone, sandstone, and shale. The Timberville Variant soils are in depressions, on alluvial fans, and on narrow flood plains adjacent to small streams. Slopes range from 0 to 7 percent.

Timberville Variant soils are commonly near Berks, Frederick, Lodi, Edom, and Endcav soils. None of those soils is subject to flooding.

Typical pedon of Timberville Variant silt loam, 0 to 7 percent slopes, 3 miles southeast of Broadway, 70 yards southeast of Route 799, and 800 yards northeast of the intersection of Routes 799 and 796:

Ap—0 to 8 inches, yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable; many fine roots; common fine and very fine pores; common worm casts; 3 percent chert fragments up to 2 inches across; medium acid; abrupt smooth boundary.
B1—8 to 20 inches, yellowish brown (10YR 5/4) silt loam; few fine faint pale brown (10YR 6/3) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; few fine roots; few fine pores; 3 percent chert fragments up to 2 inches across; strongly acid; clear smooth boundary.
B2—20 to 36 inches, dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; few fine medium and coarse roots; common very fine pores; 10 percent chert fragments up to 5 inches across; strongly acid; clear smooth boundary.
A1b—36 to 41 inches, dark brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; few fine roots; common fine pores; 15 percent chert fragments up to 3 inches across; strongly acid; clear smooth boundary.
A2b—41 to 50 inches, yellowish brown (10YR 5/4) cherty loam; few fine faint brownish yellow (10YR 6/4), very pale brown (10YR 7/3), and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; few fine roots; common fine pores; 25 percent chert fragments up to 4 inches across; strongly acid; gradual wavy boundary.
Bb—50 to 60 inches, yellowish brown (10YR 5/4) and reddish yellow (7.5YR 6/6) very cherty loam; few fine faint very pale brown (10YR 7/3) mottles; weak fine subangular blocky structure; friable; few very fine roots; few very fine pores; 60 percent chert fragments up to 6 inches across; strongly acid; clear wavy boundary.
IIBtb—60 to 72 inches, red (2.5YR 4/6) clay; common medium distinct brownish yellow (10YR 6/6) and very pale brown (10YR 7/3) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; few fine pores; 5 percent chert fragments up to 3 inches across; medium acid.

The solum thickness ranges from 40 inches to more than 60 inches. The depth to bedrock ranges from 5 to 10 feet or more. Coarse fragments of chert and

sandstone, normally less than 6 inches across, make up 0 to 35 percent in the surface layer and 0 to 60 percent of individual horizons in the subsoil.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 through 5. It is silt loam, loam, or cherty silt loam.

The B1 horizon has hue of 10 YR or 7.5YR, value of 4 through 6, and chroma of 4 through 8. It is silt loam, loam, silty clay loam, clay loam, and their cherty analogues.

The B2 horizon has hue of 10YR to 7.5YR, value of 4 through 6, and chroma of 4 through 8. It is silt loam, loam, silty clay loam, clay loam, and their cherty analogues.

The Ab horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 2 through 8. The Bb horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 4 through 8. The Ab and Bb horizons are silt loam, loam, silty clay loam, clay loam, or their cherty and very cherty analogues. Some pedons do not have an Ab or Bb horizon.

The IIBtb horizon has hue of 7.5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is silty clay or clay.

Tioga series

Soils of the Tioga series are deep and well drained. They formed in alluvium derived from limestone and sandstone. They are on flood plains adjacent to the major streams and rivers. Slopes range from 0 to 3 percent.

Tioga soils commonly are near the Chavies, Craigsville, Buckton, and Millrock soils. Tioga soils have more sand in the subsoil than the Chavies, Craigsville, or Buckton soils; have fewer coarse fragments than the Craigsville soils; do not have the free carbonates typical of the Buckton soils; and have less sand in the solum than the Millrock soils.

Typical pedon of Tioga fine sandy loam, 0 to 3 percent slopes, 1/2 mile southwest of the intersection of State Routes 659 and 605 in Port Republic and 500 feet west of the South River:

Ap—0 to 12 inches, dark grayish brown (10YR 4/2) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; few fine pores; few worm casts and channels; neutral; clear smooth boundary.

B1—12 to 24 inches, brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; few fine pores; few worm casts and channels; slightly acid; abrupt smooth boundary.

B2—24 to 30 inches, very dark grayish brown (10YR 3/2) loam; weak fine subangular blocky structure; friable; few fine and very fine roots; few fine pores; few worm casts and channels; slightly acid; clear smooth boundary.

C1—30 to 44 inches, brown (10YR 4/3) loamy sand; massive; very friable; few very fine roots; many fine pores; 2 percent quartzite fragments up to 1/4 inch in diameter; few worm channels; slightly acid; clear smooth boundary.

IIC2—44 to 52 inches, dark grayish brown (2.5Y 4/2) loam; few medium distinct dark yellowish brown (10YR 4/4) and very dark gray (10YR 3/1) mottles; weak fine subangular blocky structure; friable; few very fine roots; common fine pores; slightly acid; clear smooth boundary.

IIIC3—52 to 72 inches, light olive brown (2.5Y 5/4) and dark yellowish brown (10YR 4/4) loamy sand; single grained; loose; 2 percent sandstone and quartzite gravel up to 2 inches in diameter; slightly acid; clear smooth boundary.

The solum thickness ranges from 18 to 30 inches. The depth to bedrock is more than 60 inches. The content of sandstone gravel and cobblestones ranges from 0 to 15 percent in the surface layer and 0 to 5 percent in the subsoil. The substratum in some pedons has layers of gravel and cobblestones at a depth of more than 3-1/2 feet.

The Ap horizon has hue of 10YR or 7.5YR, value of 4, and chroma of 2 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 4, and chroma of 2 through 4. It is loam or fine sandy loam.

The C horizon is loamy sand, loamy fine sand, fine sandy loam, loam, or their very gravelly or very cobbly analogues.

Typic Udorthents

Udorthents in Rockingham County consist of deep, well drained soils. They formed in alluvium derived chiefly from sandstone, quartzite, phyllite, shale, and greenstone. They are on flood plains along streams normally adjacent to or in mountainous terrain. Slopes range from 0 to 2 percent.

Udorthents commonly are near Craigsville, Hawksbill, and Millrock soils. Udorthents contain less clay than the Craigsville or Hawksbill soils and more coarse fragments than the Millrock soils.

Because of the variability of Udorthents, a typical pedon is not given. The depth to bedrock is more than 6 feet. Coarse fragments, mainly sandstone and quartzite pebbles and cobblestones, make up 20 to 70 percent of the soil. The soils are strongly acid or very strongly acid.

The A horizon has hue of 5YR through 10YR, value of 4, and chroma of 3. It ranges from loam to sandy loam and their gravelly, very gravelly, cobbly, and very cobbly analogues. The A horizon is 6 to 12 inches thick.

The C horizon dominantly has hue of 5YR through 10YR, value of 4, and chroma of 3 or 4. It ranges from loamy sand to sandy loam and their gravelly, very gravelly, cobbly, and very cobbly analogues.

Unison series

Soils of the Unison series are deep and well drained. They formed in alluvial material derived from sandstone and shale. Unison soils are on broad terraces along large streams. Slopes range from 2 to 30 percent.

Unison soils are commonly near Buchanan, Laidig, Monongahela, and Purdy soils. Unison soils do not have the fragipan typical of the Buchanan, Laidig, and Monongahela soils; are better drained than the Buchanan or Monongahela soils; and have more brown in the subsoil than the Purdy soils.

Typical pedon of Unison fine sandy loam, 2 to 7 percent slopes, eroded, 1/4 mile east of the intersection of U.S. Highway 340 and State Route 663, 80 feet east of and 80 feet north of State Route 663:

Ap—0 to 8 inches, yellowish brown (10YR 5/4) fine sandy loam; moderate fine granular structure; friable; common fine roots; 4 percent sandstone gravel; slightly acid; abrupt smooth boundary.

B21t—8 to 19 inches, yellowish red (5YR 4/8) clay; moderate fine subangular blocky structure; friable, sticky and plastic; common fine roots; few fine pores; thin continuous clay films; common worm channels and casts; 4 percent sandstone gravel; medium acid; gradual smooth boundary.

B22t—19 to 27 inches, yellowish red (5YR 4/8) clay; moderate fine angular blocky structure; friable, sticky and plastic; few fine roots; few fine pores; thin continuous brown 7.5YR 5/4 clay films; 10 percent strongly weathered sandstone gravel and cobblestones up to 4 inches in diameter; medium acid; gradual wavy boundary.

B23t—27 to 41 inches, yellowish red (5YR 4/8) clay; common medium distinct red (2.5YR 4/6) and light olive brown (2.5YR 5/6) mottles; moderate fine angular blocky structure; friable, sticky and plastic; thin continuous brown (7.5YR 4/4) clay films; 20 percent strongly weathered sandstone gravel and cobblestones up to 6 inches in diameter; medium acid; gradual wavy boundary.

B3t—41 to 60 inches; red (2.5YR 4/6) cobbly clay; common medium distinct yellowish red (5YR 4/8) and light olive brown (2.5YR 5/6) mottles; weak medium angular blocky structure; friable, slightly sticky and slightly plastic; few very fine pores; thin continuous yellowish red (5YR 4/6) clay films; 45 percent strongly weathered sandstone gravel and cobblestones up to 8 inches in diameter; strongly acid.

The solum is 40 to 60 inches thick. The depth to bedrock is more than 5 feet. Sandstone gravel and cobblestones make up 2 to 30 percent of the A horizon, 0 to 20 percent of the B2 horizon, and 10 to 50 percent of the B3 horizon.

The A horizon has hue of 10YR, value of 4 through 6, and chroma of 3 or 4. It is fine sandy loam or their gravelly or cobbly analogues.

The B2 horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 6 or 8.

Weikert series

Soils of the Weikert series are shallow and well drained. They formed in material weathered from acid shale or interbedded shale, siltstone, and sandstone. The Weikert soils are on highly dissected uplands and mountain side slopes. Slopes range from 7 to 70 percent.

Weikert soils commonly are near the Berks, Sequoia, Laidig, Calvin, Lehew, and Dekalb soils. Weikert soils are shallower to bedrock than any of those soils, have less clay in the subsoil than the Sequoia soils, have more brown than the Calvin or Lehew soils, and have less sand than the Dekalb soils.

Typical pedon of Weikert shaly silt loam in an area of Weikert-Berks shaly silt loams, 25 to 45 percent slopes, eroded, in woodland 1/4 mile northwest of the intersection of Routes 611 and 612:

O1—1 inch to 0, loose leaves and pine needles, some partially decayed.

A1—0 to 1 inch, dark grayish brown (10YR 4/2) shaly silt loam; weak fine granular structure; very friable; many fine and few medium roots; 30 percent shale fragments; strongly acid; abrupt wavy boundary.

A2—1 to 7 inches; yellowish brown (10YR 5/4) shaly silt loam; weak fine granular structure; friable; many fine and common medium roots; 45 percent shale fragments; strongly acid; abrupt wavy boundary.

B—7 to 14 inches; pale brown (10YR 6/3) very shaly silt loam; massive; friable; few fine and medium roots; 60 percent shale fragments; strongly acid; abrupt smooth boundary.

C—14 to 19 inches; pale brown (10YR 6/3) weathered shale; silt loam coatings between shale fragments; strongly acid; clear wavy boundary.

R—19 inches; shale bedrock.

The solum thickness is less than 20 inches. The depth to bedrock is 12 to 20 inches. Shale, siltstone, and fine-grained sandstone make up 30 to 60 percent of the solum and increase with depth.

The A horizon has hue of 10YR, value of 3 through 6, and chroma of 2 through 6.

The B horizon has hue of 10YR, value of 5 or 6, and chroma of 3 through 6. It is very shaly or very channery silt loam or loam.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 3 through 6. It is very shaly or very channery silt loam or loam.

Wheeling series

The Wheeling soils are deep and well drained. They formed in alluvium weathered from limestone, shale, and sandstone. The Wheeling soils are on low terraces adjacent to flood plains. Slopes range from 0 to 4 percent. The Wheeling soils in this survey area are a taxadjunct to the Wheeling series because they have slightly more sand in the upper part of the B horizon and higher value and chroma in the Ap horizon than defined in the range for the series. These differences do not significantly affect the use and management of the soils.

Wheeling soils commonly are near Allegheny, Chavies, Monongahela, Unison, and Tioga soils. Wheeling soils have less sand and a higher base saturation than the Allegheny soils, have less sand and more clay than the Chavies or Tioga soils, do not have the fragipan typical of the Monongahela soils, and have more brown and less clay in the subsoil than the Unison soils.

Typical pedon of Wheeling fine sandy loam, 0 to 4 percent slopes, 0.6 mile southwest of Lynnwood and 300 feet northwest of the Norfolk and Western Railroad:

Ap—0 to 9 inches, dark yellowish brown (10YR 3/4) fine sandy loam; weak fine subangular blocky structure; friable; many very fine roots; few fine and very fine pores; common worm casts; few worm channels; slightly acid; abrupt smooth boundary.

B21t—9 to 19 inches; brown (7.5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; friable; many very fine roots; many very fine pores; few thin clay films; many large distinct dark yellowish brown (10YR 3/4) stains of Ap material; many worm casts and channels; medium acid; gradual smooth boundary.

B22t—19 to 36 inches, brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; few very fine roots; few very fine pores; common moderately thick clay films; many worm casts and channels; 2 percent black manganese stains; medium acid; gradual smooth boundary.

B23t—36 to 51 inches, brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; few very fine pores; common thin clay films; many large distinct dark yellowish brown (10YR 3/4) stains; few worm casts and channels; 2 percent black manganese stains; medium acid; gradual smooth boundary.

B3t—51 to 64 inches, brown (7.5YR 4/4) sandy clay loam; weak coarse subangular blocky structure; firm, slightly sticky, slightly plastic; few fine pores; few worm casts and channels; few thin clay films; medium acid; clear smooth boundary.

C—64 to 72 inches, brown (7.5YR 4/4) sandy loam; massive; friable; less than 10 percent angular sandstone and shale fragments; slightly acid.

The solum thickness is 40 inches to more than 60 inches. The depth to bedrock is more than 5 feet. The content of sandstone pebbles and cobblestones ranges from 0 to 15 percent in the A and B horizons and from 0 to 70 percent in the C horizon.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 4.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 6. It is sandy clay loam or clay loam.

The C horizon is fine sandy loam, sandy loam, gravelly sandy loam, and very gravelly sandy loam.

morphology of the soils

The results of the soil-forming factors can be observed by the different layers, or soil horizons, in a soil profile. The soil profile extends from the surface down to materials that are little altered by the soil-forming processes.

Most soils contain three major horizons, called A, B and C horizons. These horizons may be further subdivided by use of numbers and letters to indicate changes within one horizon. An example would be the B2t horizon, which represents a B horizon that contains an accumulation of clay.

The A horizon is the surface layer. An A1 horizon is that part of the surface layer with the largest accumulation of organic matter. The A horizon has more organic matter than any other layer in the profile. The A horizon is also the layer of maximum leaching, or eluviation, of clay and iron. If considerable leaching has taken place and organic matter has not darkened the material, the horizon is called an A2. In Rockingham County, a distinct A2 horizon is in forested, mountain soils, such as Laidig and Dekalb soils.

The B horizon underlies the A horizon and is commonly called the subsoil. It is the horizon of maximum accumulation, or illuviation, of clay, iron, aluminum, or other compounds leached from the surface layer. In some soils, the B horizon is formed by alteration of the soil material in place with very little illuviation. The alteration may be caused by oxidation and reduction of iron or by the weathering of clay minerals. The B horizon commonly has blocky structure, generally is firmer, and in the case of well drained soils, is brighter colored than the A1 horizon. The Edom soils are an example of soils with a well developed B horizon.

The C horizon is below the B horizon, or it is below the A horizon in soils that do not have a B horizon. It consists of materials that are little altered by the soil-forming processes but that may be modified by weathering.

In Rockingham County several processes are involved in the formation of soil horizons. Among these are the accumulation of organic matter, the leaching of soluble salts, the reduction and transfer of iron, the formation

and translocation of clay minerals, and the layering of parent materials. These processes are continually taking place, generally at the same time throughout the profile.

The accumulation of organic matter in the A horizon takes place with the decomposition of plant residue. In many places in Rockingham County this horizon has been eroded or has been mixed with materials from underlying horizons through cultivation. The organic matter content of the surface layer varies from low in sandy soils, for example, Craigsville soils, to high in the fine-textured, flood plain soils, of which Fluvaquents are an example.

In order for soils to have a distinct subsoil horizon, some of the lime and other soluble salts must be leached and clay, iron, organic matter, and other materials must be translocated from the surface layer to the subsoil. Among the factors that affect the leaching are the kind of salts originally present, the annual precipitation, and the texture of the soil. Most of the soils in the county are leached. Exceptions to this are alluvial areas, which are recharged with carbonates by limestone springs, and soils that are shallow to calcareous rock.

The process of chemical reduction and transfer of iron occurs in soils where drainage is impeded. The naturally wet soils of Rockingham County are gray in one or more of their horizons as a result of the reduction of iron. The Fluvaquents and Purdy soils are examples of wet soils that have a high water table.

Iron that has been reduced in areas where the soil is poorly aerated generally becomes mobile and commonly is removed from the soil. Part of the mobile iron moves within the original horizon or to another horizon. Part of this iron is segregated and reoxidized to form the red, yellowish red, strong brown, and yellowish brown mottles that are common in some horizons of soils having impeded drainage. The reduction, segregation, and reoxidation of iron resulted in mottles in the subsoil horizon of the Buchanan soils.

When silicate clay forms from primary materials, some iron generally is freed as hydrated oxide. Depending on the degree of hydration, such oxides normallly are reddish. The hydrated iron oxide in most well developed and freely aerated soils in Rockingham County causes the soils to be bright brown and red. For example, the color of the subsoil of the Swimley and Fauquier soils is a result of free iron oxide.

The weathering of primary minerals to silicate clay minerals, largely by the process of hydrolysis, results finally in the production of kaolinitic clays. Kaolinite is regarded as the most common clay mineral in the Rockingham County soils. Other clays, such as montmorillinite and illite, are in the soils in smaller amounts. A few soils, such as Carbo, Chilhowie, and Endcav soils, have a B horizon that has montmorillonitic clays.

Layering influences the formation of soil horizons in several ways. The formation of silicate clays varies directly with the amount of weatherable minerals in each layer. A layer high in slowly weatherable quartz sand forms less silicate clay than does a layer high in easily weathered silt-sized minerals. Water commonly moves more slowly between layers of different textures, and this results in a temporary excess of water in the layer above. As the water slows down, minerals carried down by percolation are deposited or are precipitated, commonly forming either a compact layer or a clay layer that is slowly permeable to very slowly permeable. If the compact layer is high in sand or silt, it is called a fragipan. Genesis of the fragipan is not fully understood, but studies show that swelling and shrinking takes place in alternating wet and dry periods. This may account for the packing of soil particles and for a gross polygonal pattern of cracks that occurs in the fragipan. Clay, silica, and oxides of aluminum are the most likely cementing agents causing brittleness and hardness. The Monongahela and Burketown soils are examples of soils in Rockingham County that have a well developed fragipan.

formation of the soils

In this section the factors that have affected the formation of the soils in Rockingham County are described.

factors of soil formation

Soil is formed by weathering and other processes that act upon parent material. The characteristics of the soil at any given point depend upon the interaction of parent material, climate, plants and animals, relief, and time.

Climate and plants and animals are the active forces of soil formation. They act on the parent material accumulated through the weathering of rocks and slowly change it into soil. However, all five factors contribute to the formation of every soil. The relative importance of each differs from place to place. In extreme cases one factor dominates the formation of a soil and determines most of its properties. In general, however, it is the combined action of the five factors that determines the character of each soil.

parent material

Parent material is the unconsolidated mass from which a soil forms. It is largely responsible for the chemical and mineralogical composition of the soil and the rate that soil-forming processes take place. Three kinds of parent material are in Rockingham County: residual, alluvial, and colluvial.

The common residual parent materials are limestone, shale, sandstone, siltstone, and greenstone. Soils formed from limestone, including dolomite, and from shale are most extensive in the valley and have a wide range of characteristics. Limestone-derived soils typically have a silty surface and a clayey subsoil; two examples, are Lodi and Frederick soils. Residuum from acid shale and siltstone is the parent material for the Weikert and the Berks soils, and the acid sandstone residuum is the parent material for Dekalb and Lehew soils. Greenstone-derived soils, such as Fauquier and Myersville soils, are confined to the Blue Ridge Mountains in this county.

The alluvial parent material is of local origin along the smaller streams and is of local and general origin along the major rivers. Soils on the alluvial bottom lands vary widely in texture and stage of development. Examples are Buckton, Chavies, Millrock, Monongahela, and Purdy soils.

The colluvial parent material is dominantly on lower mountain slopes. The soils that formed in this material are primarily coarse textured or medium textured. Examples are Laidig, Buchanan, and Shelocta Variant soils.

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.

Because the amount of precipitation in this county exceeds evapotranspiration, the soils have been leached. Much of the soluble material that originally was in the soil or released through weathering has been removed. Exceptions to this are alluvial areas, such as the Massanetta soils, which are recharged with carbonates by limestone springs. Precipitation is mainly responsible for the clayey subsoil that characterizes most soils in the county. In addition to the leaching of soluble materials, water that percolates through the soil moves small amounts of clay from the surface layer to the subsoil. Consequently, the soils in the county have more clay in the subsoil than in the surface layer.

plant and animal life

Vegetation influences the amount of organic matter in the soil, the color of the surface layer, and to some extent the amount of nutrients. Animals such as earthworms and burrowing animals help keep the soil open and porous. Micro-organisms decompose the vegetation and dead animal matter, thus releasing nutrients for plant food. The native vegetation of the area consisted mainly of hardwoods. Soils that developed under this vegetation are generally less acid than those that developed under coniferous vegetation.

The activities of men—the clearing of the forests, cultivation, introduction of new plants, and changes in natural drainage—have had an effect on soil development. The greatest influence of these was caused by the mixing of the upper layers of the soil to form a plow layer, cultivating strongly sloping soils and thus accelerating erosion, and liming and fertilizing to

change the content of plant nutrients, especially in the upper layers of the soil.

relief

The relief of an area is largely determined by 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 moisture in the soil, erosion, temperature, and plant cover.

Rockingham County has mountains on the western and eastern sides that approach or exceed 4,000 feet in elevation. The valley in the center of the county is split by the 3,000-foot Massanutten Mountain. The mountain systems are underlain by resistant rocks such as metabasalts, sandstones, and quartzites. The valley relief is further affected by the underlying geology. This includes the Edinburg limestones and Martinsburg shale, which form the lowest areas with the least relief. The more hilly valley areas are characteristically underlain by other rocks. The Beekmantown Dolomite, which generally contains massive chert beds, is an example. The shale areas of the county have a more well defined drainage pattern than the other areas.

Most soils on uplands are naturally well drained. Soils on terraces and flood plains range from well drained to poorly drained. Soil drainage is commonly related to the position of the soil. Soils in low, nearly level positions, for example, commonly are poorly drained, while soils on more sloping areas typically are well drained.

time

The degree of development or degree of horizon differentiation within the soil is related to the amount of time the soil has been subjected to the other soil forming factors. A soil that has little or no horizon development is considered a young soil, while one that has strongly developed horizons is considered old.

The oldest soils in Rockingham County mainly are those formed in residuum from shale and limestone, for example, the Frederick, Edom, and Swimley soils. In general, these soils are in less sloping, relatively stable positions and have formed in easily weatherable material, and they have a strong degree of horizon differentiation. Soils formed in recent alluvium, such as Millrock soils, have been in place only a relatively short time and show little or no development other than an accumulation of organic matter in the surface layer. Soils on terraces, such as Allegheny and Monongahela soils, have recognizable horizon development and are generally intermediate in degree of development between the old residual soils and the very young alluvial soils. On very steep slopes, geologic erosion has removed soil material in a relatively short period of time and the soil material is generally not in place long enough to develop distinct horizons.

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(3) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962]

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glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

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

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.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

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 periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

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

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

Fast intake (in tables). The rapid movement of water into the soil.

Fine textured soil. Sandy clay, silty clay, and clay.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 37.5 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

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 upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

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. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 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. For example, slope, differences in slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

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

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

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

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-size particles.

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.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. 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.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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.

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 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

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.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-75 at Dale Enterprise, Va.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	42.7	22.3	32.5	69	-5	47	1.76	.96	2.40	5	6.1
February---	45.3	24.1	34.7	69	1	40	2.26	1.28	3.06	6	7.3
March------	54.1	30.9	42.5	80	12	175	2.96	1.69	3.98	7	6.2
April------	65.5	40.1	52.9	86	21	387	2.58	1.47	3.47	7	.6
May--------	74.4	49.2	61.8	90	30	676	3.45	2.18	4.59	8	.0
June-------	82.0	56.8	69.4	95	39	882	3.39	1.92	4.58	7	.0
July-------	85.5	60.8	73.2	97	46	1,029	3.70	1.93	5.15	8	.0
August-----	83.9	59.6	71.8	96	45	986	3.94	1.84	5.64	7	.0
September--	77.8	53.0	65.4	94	32	762	3.23	1.72	4.45	6	.0
October----	67.4	42.4	54.9	85	21	462	2.42	.94	3.61	4	.0
November---	55.2	33.2	44.2	76	10	148	2.16	1.19	2.94	5	1.8
December---	44.9	25.1	35.0	69	2	77	2.26	.96	3.30	5	5.9
Yearly:											
Average--	64.9	41.5	53.2	---	---	---	---	---	---	---	---
Extreme--	---	---	---	98	-5	---	---	---	---	---	---
Total----	---	---	---	---	---	5,671	34.11	29.39	38.37	75	27.9

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-75 at Dale Enterprise, Va.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 21	May 1	May 18
2 years in 10 later than--	April 15	April 27	May 12
5 years in 10 later than--	April 4	April 18	April 29
First freezing temperature in fall:			
1 year in 10 earlier than--	October 20	October 7	September 25
2 years in 10 earlier than--	October 24	October 13	September 30
5 years in 10 earlier than--	November 2	October 23	October 10

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-75 at Dale Enterprise, Va.]

Probability	Length of growing season if daily minimum temperature is		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	192	166	138
8 years in 10	198	173	147
5 years in 10	211	187	163
2 years in 10	223	201	179
1 year in 10	230	209	187

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1B	Allegheny fine sandy loam, 1 to 7 percent slopes	4,138	0.7
2B	Allegheny cobbly fine sandy loam, 1 to 7 percent slopes	476	0.1
3B	Allegheny-Monongahela fine sandy loams, 0 to 7 percent slopes	665	0.1
4A	Aquic Udifluvents, nearly level	3,029	0.5
5C2	Berks-Weikert shaly silt loams, 7 to 15 percent slopes, eroded	4,421	0.8
5D2	Berks-Weikert shaly silt loams, 15 to 25 percent slopes, eroded	9,266	1.7
6C2	Berks-Weikert very stony silt loams, 7 to 15 percent slopes, eroded	415	0.1
6D2	Berks-Weikert very stony silt loams, 15 to 25 percent slopes, eroded	967	0.2
7A	Buchanan silt loam, 0 to 5 percent slopes	1,076	0.2
8B	Buchanan cobbly fine sandy loam, 2 to 7 percent slopes	2,900	0.5
8C	Buchanan cobbly fine sandy loam, 7 to 15 percent slopes	1,847	0.3
9C	Buchanan very stony fine sandy loam, 7 to 15 percent slopes	3,184	0.6
10A	Buckton loam, 0 to 4 percent slopes	236	*
11B	Burketown fine sandy loam, 2 to 10 percent slopes	794	0.1
12B	Carbo-Endcav-Rock outcrop complex, 2 to 7 percent slopes	2,346	0.4
12C	Carbo-Endcav-Rock outcrop complex, 7 to 15 percent slopes	3,623	0.7
13A	Chavies fine sandy loam, 0 to 4 percent slopes	4,847	0.9
14B2	Chilhowie silty clay, 2 to 7 percent slopes, eroded	1,226	0.2
14C2	Chilhowie silty clay, 7 to 15 percent slopes, eroded	3,882	0.7
14D2	Chilhowie silty clay, 15 to 25 percent slopes, eroded	2,910	0.5
15B2	Chilhowie silty clay, rocky, 2 to 7 percent slopes, eroded	728	0.1
15C2	Chilhowie silty clay, rocky, 7 to 15 percent slopes, eroded	2,207	0.4
15D2	Chilhowie silty clay, rocky, 15 to 25 percent slopes, eroded	1,938	0.4
16E3	Chilhowie clay, rocky, 25 to 45 percent slopes, severely eroded	953	0.2
17B2	Chilhowie-Edom silty clay loams, 2 to 7 percent slopes, eroded	578	0.1
17C2	Chilhowie-Edom silty clay loams, 7 to 15 percent slopes, eroded	2,553	0.5
17D2	Chilhowie-Edom silty clay loams, 15 to 25 percent slopes, eroded	1,295	0.2
18B	Cotaco fine sandy loam, 0 to 7 percent slopes	2,239	0.4
19B	Cotaco cobbly fine sandy loam, 0 to 7 percent slopes	2,222	0.4
20B	Cotaco Variant cobbly loam, 1 to 7 percent slopes	1,658	0.3
21B	Craigsville cobbly fine sandy loam, 0 to 4 percent slopes	5,973	1.1
22F	Drall extremely stony sandy loam, 40 to 70 percent slopes	25,895	4.7
23B2	Edom silty clay loam, 2 to 7 percent slopes, eroded	3,239	0.6
23C2	Edom silty clay loam, 7 to 15 percent slopes, eroded	6,063	1.1
23D2	Edom silty clay loam, 15 to 25 percent slopes, eroded	2,490	0.4
24B2	Endcav silt loam, 2 to 7 percent slopes, eroded	2,758	0.5
24C2	Endcav silt loam, 7 to 15 percent slopes, eroded	1,413	0.3
25B2	Endcav silt loam, rocky, 2 to 7 percent slopes, eroded	2,432	0.4
25C2	Endcav silt loam, rocky, 7 to 15 percent slopes, eroded	2,930	0.5
26C2	Fauquier stony silt loam, 7 to 15 percent slopes, eroded	233	*
26D2	Fauquier stony silt loam, 15 to 25 percent slopes, eroded	536	0.1
27E	Fauquier very stony silt loam, 25 to 50 percent slopes	3,532	0.6
28A	Fluvaquents, nearly level	3,815	0.7
29B2	Frederick and Lodi silt loams, 2 to 7 percent slopes, eroded	12,612	2.3
29C2	Frederick and Lodi silt loams, 7 to 15 percent slopes, eroded	44,253	8.0
29D2	Frederick and Lodi silt loams, 15 to 25 percent slopes, eroded	13,627	2.5
29E2	Frederick and Lodi silt loams, 25 to 45 percent slopes, eroded	338	0.1
30C3	Frederick and Lodi silty clay loams, 7 to 15 percent slopes, severely eroded	849	0.2
30D3	Frederick and Lodi silty clay loams, 15 to 35 percent slopes, severely eroded	420	0.1
31B2	Frederick and Lodi cherty silt loams, 2 to 7 percent slopes, eroded	1,378	0.2
31C2	Frederick and Lodi cherty silt loams, 7 to 15 percent slopes, eroded	8,818	1.6
31D2	Frederick and Lodi cherty silt loams, 15 to 25 percent slopes, eroded	10,436	1.9
31E2	Frederick and Lodi cherty silt loams, 25 to 45 percent slopes, eroded	1,196	0.2
32C	Frederick and Lodi very cherty silt loams, 7 to 15 percent slopes	385	0.1
32D	Frederick and Lodi very cherty silt loams, 15 to 25 percent slopes	481	0.1
32E	Frederick and Lodi very cherty silt loams, 25 to 45 percent slopes	567	0.1
33B2	Frederick and Lodi silt loams, rocky, 2 to 7 percent slopes, eroded	798	0.1
33C2	Frederick and Lodi silt loams, rocky, 7 to 15 percent slopes, eroded	5,722	1.0
33D2	Frederick and Lodi silt loams, rocky, 15 to 25 percent slopes, eroded	6,993	1.3
33E2	Frederick and Lodi silt loams, rocky, 25 to 45 percent slopes, eroded	410	0.1
34C	Frederick-Rock outcrop complex, 3 to 15 percent slopes	7,360	1.3
34E	Frederick-Rock outcrop complex, 15 to 45 percent slopes	6,129	1.1
35B	Guernsey silt loam, 2 to 7 percent slopes	2,735	0.5
36B	Hawksbill cobbly loam, 2 to 7 percent slopes	685	0.1
37B	Hawksbill very cobbly loam, 2 to 7 percent slopes	540	0.1
38C	Hawksbill extremely stony loam, 7 to 15 percent slopes	852	0.2
39B	Laidig gravelly fine sandy loam, 2 to 7 percent slopes	1,371	0.2
39C	Laidig gravelly fine sandy loam, 7 to 15 percent slopes	680	0.1
40B	Laidig cobbly fine sandy loam, 2 to 7 percent slopes	1,995	0.4
40C	Laidig cobbly fine sandy loam, 7 to 15 percent slopes	3,324	0.6

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
40D	Laidig cobbly fine sandy loam, 15 to 25 percent slopes	1,695	0.3
40E	Laidig cobbly fine sandy loam, 25 to 45 percent slopes	643	0.1
41C	Laidig very stony fine sandy loam, 7 to 15 percent slopes	2,438	0.4
41D	Laidig very stony fine sandy loam, 15 to 25 percent slopes	11,130	2.0
41E	Laidig very stony fine sandy loam, 25 to 45 percent slopes	11,381	2.0
42C	Laidig-Buchanan extremely stony loams, 7 to 20 percent slopes	1,239	0.2
43C	Lehew, Dekalb, and Calvin cobbly soils, 5 to 15 percent slopes	5,351	1.0
43D	Lehew, Dekalb, and Calvin cobbly soils, 15 to 25 percent slopes	7,213	1.3
44E	Lehew, Dekalb, and Calvin very stony soils, 25 to 45 percent slopes	13,176	2.4
44F	Lehew, Dekalb, and Calvin very stony soils, 45 to 65 percent slopes	57,280	10.3
45A	Massanetta silt loam, 0 to 2 percent slopes	822	0.1
46A	Millrock loamy sand, 0 to 4 percent slopes	2,002	0.4
47B	Monongahela fine sandy loam, 0 to 7 percent slopes	6,947	1.3
47C2	Monongahela fine sandy loam, 7 to 15 percent slopes, eroded	1,546	0.3
48B	Monongahela cobbly fine sandy loam, 0 to 7 percent slopes	1,001	0.2
48C	Monongahela cobbly fine sandy loam, 7 to 15 percent slopes	542	0.1
49C	Myersville very stony silt loam, 7 to 15 percent slopes	382	0.1
49D	Myersville very stony silt loam, 15 to 25 percent slopes	581	0.1
49F	Myersville very stony silt loam, 25 to 60 percent slopes	7,301	1.3
50B	Nixa, Frederick-Lodi cherty silt loams, 2 to 7 percent slopes	230	*
50C	Nixa-Frederick-Lodi cherty silt loams, 7 to 15 percent slopes	747	0.1
51	Pits, gravel	95	*
52	Pits, sand	44	*
53	Pits and dumps, limestone	546	0.1
54A	Purdy silt loam, 0 to 2 percent slopes	1,859	0.3
55C	Rock outcrop-Carbo complex, 0 to 20 percent slopes	5,632	1.0
56C	Rock outcrop-Frederick complex, 2 to 15 percent slopes	3,454	0.6
56D	Rock outcrop-Frederick complex, 15 to 45 percent slopes	8,844	1.6
57E	Rock outcrop-Laidig complex, 25 to 55 percent slopes	1,366	0.2
58B2	Sequoia silt loam, 2 to 7 percent slopes, eroded	1,204	0.2
58C2	Sequoia silt loam, 7 to 15 percent slopes, eroded	443	0.1
59B2	Sequoia-Berks silt loams, 2 to 7 percent slopes, eroded	2,182	0.4
59C2	Sequoia-Berks silt loams, 7 to 15 percent slopes, eroded	4,200	0.8
59D2	Sequoia-Berks silt loams, 15 to 25 percent slopes, eroded	1,138	0.2
60C	Sequoia-Berks stony loams, 7 to 15 percent slopes	1,648	0.3
60D	Sequoia-Berks stony loams, 15 to 25 percent slopes	2,845	0.5
61B	Shelocta Variant stony loam, 2 to 10 percent slopes	429	0.1
62C	Shelocta Variant very stony loam, 5 to 15 percent slopes	1,161	0.2
63B	Shenval loam, 2 to 7 percent slopes	1,337	0.2
63C2	Shenval loam, 7 to 15 percent slopes, eroded	975	0.2
63D2	Shenval loam, 15 to 25 percent slopes, eroded	253	*
64C	Sherando cobbly sandy loam, 7 to 15 percent slopes	343	0.1
64D	Sherando cobbly sandy loam, 15 to 35 percent slopes	329	0.1
65B2	Swimley silty clay loam, 2 to 7 percent slopes, eroded	619	0.1
65C2	Swimley silty clay loam, 7 to 15 percent slopes, eroded	1,085	0.2
66D	Sylco flaggy silt loam, 15 to 25 percent slopes	240	*
66E	Sylco flaggy silt loam, 25 to 45 percent slopes	1,322	0.2
67F	Sylco very stony silt loam, 25 to 60 percent slopes	12,666	2.3
68B	Timberville Variant silt loam, 0 to 7 percent slopes	2,175	0.4
69A	Tioga fine sandy loam, 0 to 3 percent slopes	1,543	0.3
70A	Typic Udorthents, nearly level	12,670	2.3
71B2	Unison fine sandy loam, 2 to 7 percent slopes, eroded	3,070	0.6
71C2	Unison fine sandy loam, 7 to 15 percent slopes, eroded	1,225	0.2
72B2	Unison cobbly fine sandy loam, 2 to 7 percent slopes, eroded	700	0.1
72C2	Unison cobbly fine sandy loam, 7 to 15 percent slopes, eroded	1,142	0.2
72D2	Unison cobbly fine sandy loam, 15 to 30 percent slopes, eroded	673	0.1
73	Urban land	527	0.1
74E2	Weikert-Berks shaly silt loam, 25 to 45 percent slopes, eroded	29,152	5.2
74F2	Weikert-Berks shaly silt loams, 45 to 70 percent slopes, eroded	4,353	0.8
75E2	Weikert-Berks very stony silt loams, 25 to 45 percent slopes, eroded	8,069	1.5
75F2	Weikert-Berks very stony silt loams, 45 to 70 percent slopes, eroded	34,021	6.1
76A	Wheeling fine sandy loam, 0 to 4 percent slopes	908	0.2
	Water	504	0.1
	Total	555,520	100.0

* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Corn silage	Wheat	Barley	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
1B---------- Allegheny	135	20	50	60	6.0	3.5	7.0
2B---------- Allegheny	130	19	45	55	6.0	3.0	6.5
3B---------- Allegheny-Monongahela	130	19	43	55	---	3.3	5.5
4A**. Aquic Udifluvents							
5C2---------- Berks-Weikert	---	---	40	45	3.0	2.5	5.0
5D2, 6C2, 6D2---------- Berks-Weikert	---	---	---	---	---	---	---
7A---------- Buchanan	100	16	40	---	3.5	3.0	7.0
8B---------- Buchanan	100	16	40	---	---	3.0	7.0
8C---------- Buchanan	90	15	35	---	---	3.0	7.0
9C---------- Buchanan	---	---	---	---	---	---	---
10A---------- Buckton	150	24	55	60	5.5	3.5	7.5
11B---------- Burketown	130	19	45	50	3.5	3.0	7.5
12B---------- Carbo-Endcav-Rock outcrop	---	---	---	---	---	---	4.0
12C---------- Carbo-Endcav-Rock outcrop	---	---	---	---	---	---	4.0
13A---------- Chavies	150	24	45	50	5.0	3.5	7.0
14B2---------- Chilhowie	70	12	50	50	---	2.5	4.0
14C2---------- Chilhowie	---	---	50	50	---	2.5	4.0
14D2---------- Chilhowie	---	---	---	---	---	2.5	4.0
15B2---------- Chilhowie	70	12	50	50	---	2.5	4.0
15C2---------- Chilhowie	---	---	50	50	---	2.5	4.0
15D2---------- Chilhowie	---	---	---	---	---	2.5	4.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Barley	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
16E3---------- Chilhowie	---	---	---	---	---	---	---
17B2---------- Chilhowie-Edom	90	14	55	55	---	3.0	6.0
17C2---------- Chilhowie-Edom	80	12	50	50	---	3.0	6.0
17D2---------- Chilhowie-Edom	---	---	---	---	---	---	5.5
18B---------- Cotaco	140	21	40	55	---	3.5	6.0
19B---------- Cotaco	125	18	35	50	---	3.0	5.5
20B---------- Cotaco Variant	135	20	45	50	---	3.0	6.0
21B---------- Craigsville	70	10	25	---	2.0	1.5	2.0
22F---------- Drall	---	---	---	---	---	---	---
23B2---------- Edom	125	20	45	---	4.0	3.0	7.5
23C2---------- Edom	115	18	40	---	3.5	3.0	6.5
23D2---------- Edom	90	16	40	---	3.0	2.5	5.5
24B2---------- Endcav	140	22	45	60	7.0	3.5	6.5
24C2---------- Endcav	130	20	40	50	6.0	3.0	6.5
25B2---------- Endcav	150	22	45	60	7.0	3.5	6.5
25C2---------- Endcav	145	20	40	50	6.0	3.0	6.5
26C2---------- Fauquier	125	20	45	55	6.0	3.5	9.5
26D2---------- Fauquier	90	14	40	45	5.5	3.0	8.5
27E---------- Fauquier	---	---	---	---	---	---	---
28A**. Fluvaquents							
29B2---------- Frederick and Lodi	150	22	55	60	7.0	3.7	7.5
29C2---------- Frederick and Lodi	145	20	50	55	6.5	3.2	7.5
29D2---------- Frederick and Lodi	120	18	45	50	6.0	3.3	7.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Barley	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
29E2--- Frederick and Lodi	---	---	---	---	---	---	5.0
30C3--- Frederick and Lodi	115	19	40	45	5.0	3.0	5.0
30D3--- Frederick and Lodi	105	16	---	---	4.0	2.5	5.0
31B2--- Frederick and Lodi	135	21	55	60	7.0	3.7	7.5
31C2--- Frederick and Lodi	125	19	50	55	6.5	3.2	7.5
31D2--- Frederick and Lodi	110	17	45	50	6.0	3.2	7.0
31E2--- Frederick and Lodi	---	---	---	---	---	---	5.0
32C--- Frederick and Lodi	---	---	---	---	---	---	---
32D--- Frederick and Lodi	---	---	---	---	---	---	---
32E--- Frederick and Lodi	---	---	---	---	---	---	---
33B2--- Frederick and Lodi	150	22	55	---	4.0	3.7	7.0
33C2--- Frederick and Lodi	145	20	50	---	4.5	3.2	7.0
33D2--- Frederick and Lodi	120	18	45	---	4.3	3.3	7.0
33E2--- Frederick and Lodi	---	---	---	---	---	---	---
34C--- Frederick-Rock outcrop	---	---	---	---	---	---	5.0
34E--- Frederick-Rock outcrop	---	---	---	---	---	---	---
35B--- Guernsey	100	16	---	---	---	4.0	6.0
36B--- Hawksbill	80	15	40	---	---	2.0	4.5
37B--- Hawksbill	---	---	---	---	---	---	4.0
38C--- Hawksbill	---	---	---	---	---	---	---
39B--- Laidig	120	18	40	55	4.0	3.0	4.5
39C--- Laidig	115	17	35	50	4.0	3.0	4.5
40B--- Laidig	100	20	40	55	4.0	3.0	4.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Barley	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
40C---------- Laidig	115	18	35	50	4.0	3.0	4.5
40D---------- Laidig	90	15	30	45	3.5	2.5	4.0
40E, 41C, 41D, 41E-------- Laidig	---	---	---	---	---	---	---
42C---------- Laidig-Buchanan	---	---	---	---	---	---	---
43C---------- Lehew, Dekalb, and Calvin	---	---	---	---	---	2.4	4.0
43D---------- Lehew, Dekalb, and Calvin	---	---	---	---	---	2.0	4.0
44E, 44F---------- Lehew, Dekalb, and Calvin	---	---	---	---	---	---	3.0
45A---------- Massanetta	120	18	---	40	---	3.0	5.5
46A---------- Millrock	90	14	30	40	3.0	2.0	5.0
47B---------- Monongahela	130	19	35	45	---	3.0	5.5
47C2---------- Monongahela	110	17	35	40	---	3.0	5.5
48B---------- Monongahela	125	18	35	45	---	3.0	5.5
48C---------- Monongahela	105	16	30	40	3.0	3.0	5.5
49C, 49D---------- Myersville	---	---	---	---	---	---	5.0
49F---------- Myersville	---	---	---	---	---	---	---
50B---------- Nixa, Frederick-Lodi	---	---	---	---	---	3.0	4.0
50C---------- Nixa-Frederick-Lodi	---	---	---	---	---	---	---
51**, 52**. Pits							
53**. Pits and dumps							
54A---------- Purdy	---	---	---	---	---	2.0	3.0
55C---------- Rock outcrop-Carbo	---	---	---	---	---	---	---
56C---------- Rock outcrop-Frederick	---	---	---	---	---	---	---
56D---------- Rock outcrop-Frederick	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Barley	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
57E---------- Rock outcrop-Laidig	---	---	---	---	---	---	---
58B2---------- Sequoia	80	11	45	55	2.7	2.5	5.5
58C2---------- Sequoia	70	10	40	50	2.5	2.5	5.0
59B2---------- Sequoia-Berks	75	10	40	50	2.5	2.5	5.0
59C2---------- Sequoia-Berks	---	---	40	45	2.0	2.5	4.5
59D2---------- Sequoia-Berks	---	---	---	---	---	2.5	4.0
60C, 60D---------- Sequoia-Berks	---	---	---	---	---	---	---
61B---------- Shelocta Variant	---	---	---	---	---	---	---
62C---------- Shelocta Variant	---	---	---	---	---	---	---
63B---------- Shenval	160	25	50	60	7.0	4.5	7.5
63C2---------- Shenval	150	22	45	55	6.5	4.5	7.5
63D2---------- Shenval	120	20	40	50	5.5	4.2	7.0
64C---------- Sherando	---	---	---	---	2.5	2.0	5.4
64D---------- Sherando	---	---	---	---	---	---	---
65B2---------- Swimley	150	22	45	55	6.5	3.5	7.0
65C2---------- Swimley	145	20	40	50	6.0	3.0	6.5
66D, 66E---------- Sylco	---	---	---	---	---	---	---
67F---------- Sylco	---	---	---	---	---	---	---
68B---------- Timberville Variant	120	20	55	60	6.0	3.0	6.0
69A---------- Tioga	120	18	---	---	---	3.5	7.0
70A**. Typic Udorthents							
71B2---------- Unison	140	20	50	55	5.0	3.5	7.5
71C2---------- Unison	135	19	45	55	4.5	3.0	7.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Barley	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
72B2---------- Unison	125	19	43	55	5.0	3.5	7.0
72C2---------- Unison	120	18	40	50	4.5	3.3	6.5
72D2---------- Unison	90	15	35	45	4.0	3.2	6.0
73**. Urban land							
74E2, 74F2, 75E2, 75F2---- Weikert-Berks	---	---	---	---	---	---	---
76A---------- Wheeling	150	22	45	55	4.5	3.0	7.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
1B---------- Allegheny	2o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Virginia pine------- Eastern white pine-- Shortleaf pine------	80 90 76 90 76	Eastern white pine, Austrian pine**, yellow-poplar, black walnut, Scotch pine**, Norway spruce**.
2B---------- Allegheny	2o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- Yellow-poplar------- Shortleaf pine------ Virginia pine-------	80 90 90 76 76	Eastern white pine, black walnut, yellow-poplar, Scotch pine**.
3B*: Allegheny---------	2o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Virginia pine------- Eastern white pine-- Shortleaf pine------	80 90 76 90 76	Eastern white pine, Austrian pine**, yellow-poplar, black walnut, Norway spruce**.
Monongahela-------	3o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Eastern white pine-- Virginia pine------- White ash---------- Black walnut--------	70 85 76 66 --- ---	Eastern white pine.
5C2*: Berks----------	3f	Slight	Slight	Moderate	Slight	Northern red oak---- Black oak---------- Virginia pine-------	70 70 70	Virginia pine, eastern white pine, Norway spruce**, Scotch pine**.
Weikert----------	4d	Slight	Slight	Severe	Moderate	Northern red oak---- Virginia pine-------	59 56	Virginia pine, shortleaf pine, eastern white pine.
5D2*: Berks---------- [North aspect]	3f	Slight	Moderate	Moderate	Slight	Northern red oak---- Black oak---------- Virginia pine-------	70 70 70	Virginia pine, eastern white pine, Norway spruce**, red pine***.
Weikert---------- [North aspect]	4d	Slight	Moderate	Severe	Moderate	Northern red oak---- Virginia pine-------	64 60	Eastern white pine, shortleaf pine.
5D2*: Berks---------- [South aspect]	4f	Slight	Moderate	Moderate	Slight	Northern red oak---- Black oak---------- Virginia pine-------	60 60 60	Virginia pine, eastern white pine, Norway spruce**.
Weikert---------- [South aspect]	5d	Moderate	Severe	Severe	Moderate	Northern red oak---- Virginia pine-------	55 52	Virginia pine, shortleaf pine.
6C2*: Berks----------	3f	Slight	Slight	Moderate	Slight	Northern red oak---- Black oak---------- Virginia pine-------	70 70 70	Virginia pine, eastern white pine, Norway spruce**.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
6C2*:								
Weikert	4d	Slight	Slight	Severe	Moderate	Northern red oak	59	Virginia pine, shortleaf pine, eastern white pine.
6D2*:								
Berks [North aspect]	3f	Slight	Moderate	Moderate	Slight	Northern red oak	70	Virginia pine, eastern white pine, red pine***.
						Black oak	70	
						Virginia pine	70	
Weikert [North aspect]	4d	Slight	Moderate	Severe	Moderate	Northern red oak	64	Eastern white pine, shortleaf pine.
						Virginia pine	60	
6D2*:								
Berks [South aspect]	4f	Slight	Moderate	Severe	Slight	Northern red oak	60	Virginia pine, eastern white pine.
						Black oak	60	
						Virginia pine	60	
Weikert [South aspect]	5d	Slight	Moderate	Severe	Moderate	Northern red oak	55	Virginia pine, shortleaf pine.
						Virginia pine	52	
7A, 8B, 8C Buchanan	3o	Slight	Slight	Slight	Slight	Northern red oak	66	Northern red oak, yellow-poplar, sugar maple, eastern white pine, Norway spruce**.
						Yellow-poplar	---	
9C Buchanan	3o	Slight	Slight	Slight	Slight	Northern red oak	66	Northern red oak, yellow-poplar, sugar maple, eastern white pine.
						Yellow-poplar	76	
10A Buckton	2w	Slight	Moderate	Slight	Slight	Yellow-poplar	95	Eastern white pine, black walnut, yellow-poplar, Scotch pine**.
						Northern red oak	80	
						Eastern white pine	90	
11B Burketown	3w	Slight	Moderate	Slight	Slight	Northern red oak	70	Eastern white pine.
						Virginia pine	70	
						Eastern white pine	80	
						Yellow-poplar	80	
12B*, 12C*:								
Carbo	3c	Slight	Moderate	Moderate	Slight	Northern red oak	70	Eastern white pine, yellow-poplar, black walnut.
						Yellow-poplar	80	
						Eastern white pine	80	
Endcav	2c	Slight	Moderate	Slight	Slight	Northern red oak	85	Yellow-poplar, eastern white pine, black walnut.
						Yellow-poplar	90	
						Eastern white pine	90	
Rock outcrop.								
13A Chavies	2o	Slight	Slight	Slight	Slight	Northern red oak	80	Eastern white pine, yellow-poplar, black walnut, Scotch pine**.
						Yellow-poplar	90	
						Pin oak	80	
						Black walnut	---	
14B2, 14C2 Chilhowie	4c	Slight	Moderate	Moderate	Moderate	Northern red oak	60	Virginia pine, eastern white pine.
						Virginia pine	60	
						Shortleaf pine	60	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
14D2---------- Chilhowie	4r	Moderate	Severe	Moderate	Moderate	Northern red oak----	60	Virginia pine, eastern white pine.
						Virginia pine-------	60	
						Shortleaf pine------	60	
15B2, 15C2---------- Chilhowie	4c	Slight	Moderate	Moderate	Moderate	Northern red oak----	60	Virginia pine, eastern white pine.
						Virginia pine-------	60	
						Shortleaf pine------	60	
15D2---------- Chilhowie	4r	Moderate	Severe	Moderate	Moderate	Northern red oak----	60	Virginia pine, eastern white pine.
						Virginia pine-------	60	
						Shortleaf pine------	60	
16E3---------- Chilhowie	4r	Severe	Severe	Moderate	Moderate	Northern red oak----	60	Virginia pine, eastern white pine.
						Virginia pine-------	60	
						Shortleaf pine------	60	
17B2*, 17C2*: Chilhowie---------	4c	Slight	Moderate	Moderate	Moderate	Northern red oak----	60	Virginia pine, eastern white pine.
						Virginia pine-------	60	
						Shortleaf pine------	60	
Edom----------	2o	Slight	Slight	Slight	Slight	Northern red oak----	80	Eastern white pine, yellow-poplar, Norway spruce**.
						Yellow-poplar-------	90	
17D2*: Chilhowie---------	4r	Moderate	Severe	Moderate	Moderate	Northern red oak----	60	Virginia pine, eastern white pine.
						Virginia pine-------	60	
						Shortleaf pine------	60	
Edom----------	2r	Slight	Moderate	Slight	Slight	Northern red oak----	80	Eastern white pine, yellow-poplar, Norway spruce**.
						Yellow-poplar-------	90	
18B---------- Cotaco	2o	Slight	Slight	Slight	Slight	Northern red oak----	83	Eastern white pine, yellow-poplar, Virginia pine, white oak, sweetgum.
						Yellow-poplar-------	---	
						Virginia pine-------	---	
						Shortleaf pine------	---	
						Black walnut--------	---	
19B---------- Cotaco	2o	Slight	Slight	Slight	Slight	Northern red oak----	83	Eastern white pine, yellow-poplar, Virginia pine.
						Yellow-poplar-------	---	
						Black walnut--------	---	
						Shortleaf pine------	---	
20B---------- Cotaco Variant	3w	Slight	Moderate	Slight	Slight	White oak-----------	70	Eastern white pine, shortleaf pine, Virginia pine.
						Northern red oak----	70	
						Black oak-----------	70	
						Eastern white pine--	80	
						Red maple-----------	70	
21B---------- Craigsville	2o	Slight	Slight	Slight	Slight	Northern red oak----	80	Eastern white pine, yellow-poplar, Scotch pine**.
						Yellow-poplar-------	95	
						Eastern white pine--	90	
						Virginia pine-------	80	
22F---------- Drall [North aspect]	3x	Moderate	Severe	Moderate	Slight	Northern red oak----	75	Virginia pine.
						Virginia pine-------	70	
						Eastern white pine--	85	
Drall [South aspect]	4x	Moderate	Severe	Severe	Slight	Northern red oak----	65	Virginia pine.
						Virginia pine-------	60	
						Eastern white pine--	75	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
23B2, 23C2--------- Edom	2o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar-------	80 90	Eastern white pine, yellow-poplar, Norway spruce**, Scotch pine**.
23D2--------------- Edom	2r	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar-------	80 90	Eastern white pine, yellow-poplar, Norway spruce**, Scotch pine**.
24B2, 24C2, 25B2, 25C2--------------- Endcav	2c	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar------- Eastern white pine--	85 90 90	Yellow-poplar, eastern white pine, black walnut, Scotch pine**
26C2--------------- Fauquier	1c	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar-------	95 120	Yellow-poplar, eastern white pine, black walnut.
26D2--------------- Fauquier	1c	Moderate	Severe	Slight	Slight	Northern red oak---- Yellow-poplar-------	95 120	Yellow-poplar, eastern white pine, black walnut.
27E---------------- Fauquier	1r	Severe	Severe	Slight	Slight	Northern red oak---- Yellow-poplar-------	95 120	Yellow-poplar, eastern white pine, black walnut.
29B2*, 29C2*: Frederick----------	2c	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar------- Black locust-------- White oak----------- Black walnut--------	76 86 --- --- ---	Eastern white pine, yellow-poplar, Scotch pine**.
Lodi----------------	2c	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar------- White oak-----------	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**.
29D2*: Frederick----------	2c	Moderate	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar------- Black locust-------- White oak----------- Black walnut--------	76 86 --- --- ---	Eastern white pine, yellow-poplar, Scotch pine**.
Lodi----------------	2r	Moderate	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar------- White oak-----------	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**.
29E2*: Frederick----------	2c	Severe	Severe	Slight	Slight	Northern red oak---- Yellow-poplar------- Black locust-------- White oak----------- Black walnut--------	76 86 --- --- ---	Eastern white pine, yellow-poplar.
Lodi----------------	2r	Moderate	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar------- White oak-----------	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut.
30C3*: Frederick----------	2c	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar------- Black locust-------- White oak----------- Black walnut--------	76 86 --- --- ---	Eastern white pine, yellow-poplar, white oak, Scotch pine**.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
30C3*:								
Lodi	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
30D3*:								
Frederick	2c	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar, white oak, Scotch pine**
Lodi	2r	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
31B2*, 31C2*:								
Frederick	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust	76 86 ---	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
Lodi	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
31D2*, 31E2*:								
Frederick	2r	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust	76 86 ---	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
Lodi	2r	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
32C*:								
Frederick	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust	76 86 ---	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
Lodi	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
32D*:								
Frederick	2r	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust	76 86 ---	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
Lodi	2r	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**
32E*:								
Frederick	2r	Severe	Severe	Slight	Slight	Northern red oak Yellow-poplar Black locust	76 86 ---	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
32E*: Lodi	2r	Severe	Severe	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**.
33B2*, 33C2*: Frederick	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar, Scotch pine**.
Lodi	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**.
33D2*: Frederick	2c	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar, Scotch pine**.
Lodi	2r	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**.
33E2*: Frederick	2c	Severe	Severe	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar.
Lodi	2r	Severe	Severe	Slight	Slight	Northern red oak Yellow-poplar White oak	76 86 76	Eastern white pine, yellow-poplar, white oak, black walnut.
34C*: Frederick	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar.
Rock outcrop.								
34E*: Frederick	2c	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar.
Rock outcrop.								
35B---------- Guernsey	2o	Slight	Slight	Slight	Slight	Northern red oak Yellow-poplar Sugar maple Black walnut White oak Black cherry White ash	78 95 --- --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, white ash, white oak.
36B---------- Hawksbill	2o	Slight	Slight	Slight	Slight	Northern red oak Yellow-poplar	80 90	Black walnut.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
37B---------- Hawksbill	2x	Slight	Moderate	Slight	Slight	Yellow-poplar--------	90	Eastern white pine.
38C---------- Hawksbill	2x	Slight	Severe	Slight	Slight	Yellow-poplar--------	90	Eastern white pine.
39B, 39C, 40B, 40C- Laidig	3o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar-------- Eastern white pine-- Virginia pine--------	71 85 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce**, black locust.
40D---------- Laidig	3r	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar-------- Eastern white pine-- Virginia pine--------	71 85 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce**, black locust.
40E---------- Laidig	3r	Moderate	Severe	Slight	Slight	Northern red oak---- Yellow-poplar-------- Eastern white pine-- Virginia pine--------	71 85 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce**, black locust.
41C---------- Laidig	3o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar-------- Eastern white pine-- Virginia pine--------	71 85 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce**, black locust.
41D---------- Laidig	3r	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar-------- Eastern white pine-- Virginia pine--------	71 85 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce** black locust.
41E---------- Laidig	3r	Moderate	Severe	Slight	Slight	Northern red oak---- Yellow-poplar-------- Eastern white pine-- Virginia pine--------	71 85 80 70	Eastern white pine, yellow-poplar, black walnut, black locust.
42C*: Laidig----------	3x	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar-------- Eastern white pine-- Virginia pine-------- Sugar maple---------	70 80 80 70 70	Eastern white pine, yellow-poplar, black locust.
Buchanan----------	3x	Slight	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar--------	66 85	Northern red oak, yellow-poplar, sugar maple, eastern white pine.
43C*: Lehew----------	4o	Slight	Slight	Slight	Slight	Northern red oak---- Virginia pine-------- Eastern white pine--	62 57 ---	Eastern white pine, Virginia pine.
Dekalb----------	3o	Slight	Slight	Slight	Slight	Northern red oak---- Black cherry-------- White ash-----------	70 70 80	Norway spruce, yellow-poplar, black cherry.
Calvin----------	3f	Slight	Slight	Moderate	Slight	Yellow-poplar-------- Northern red oak----	81 71	Eastern white pine, red pine***, Virginia pine.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
43D*:								
Lehew [North aspect]	3r	Slight	Moderate	Slight	Slight	Northern red oak Virginia pine	67 66	Eastern white pine, Virginia pine.
Dekalb [North aspect]	2r	Slight	Moderate	Slight	Slight	Northern red oak Black cherry Yellow-poplar	76 70 93	Yellow-poplar, black cherry.
Calvin [North aspect]	2f	Slight	Moderate	Moderate	Slight	Northern red oak Yellow-poplar	77 90	Eastern white pine, Virginia pine.
43D*:								
Lehew [South aspect]	4r	Slight	Moderate	Moderate	Slight	Northern red oak Virginia pine	58 58	Eastern white pine, Virginia pine.
Dekalb [South aspect]	3r	Slight	Moderate	Slight	Slight	Northern red oak Black cherry Yellow-poplar	66 66 76	Eastern white pine, Virginia pine.
Calvin [South aspect]	3f	Slight	Moderate	Severe	Slight	Northern red oak Virginia pine	68 68	Virginia pine.
44E*:								
Lehew [North aspect]	3r	Slight	Moderate	Slight	Slight	Northern red oak Virginia pine	67 66	Eastern white pine, Virginia pine.
Dekalb [North aspect]	4r	Slight	Moderate	Moderate	Moderate	Northern red oak Black cherry	62 65	Eastern white pine, Virginia pine.
Calvin [North aspect]	2f	Slight	Moderate	Moderate	Slight	Yellow-poplar Northern red oak	90 77	Eastern white pine, Virginia pine.
44E*:								
Lehew [South aspect]	4r	Slight	Moderate	Moderate	Slight	Northern red oak Virginia pine	58 56	Eastern white pine, Virginia pine.
Dekalb [South aspect]	5r	Slight	Moderate	Severe	Slight	Northern red oak Black cherry	53 55	Eastern white pine, Virginia pine.
Calvin [South aspect]	3f	Slight	Moderate	Severe	Slight	Northern red oak	67	Eastern white pine, red pine***, Virginia pine.
44F*:								
Lehew [North aspect]	3r	Moderate	Severe	Slight	Slight	Northern red oak Virginia pine	67 68	Eastern white pine Virginia pine.
Dekalb [North aspect]	2r	Moderate	Severe	Slight	Slight	Northern red oak Black cherry Yellow-poplar	76 80 93	Eastern white pine, Virginia pine.
Calvin [North aspect]	2f	Moderate	Severe	Moderate	Slight	Yellow-poplar Northern red oak	90 77	Eastern white pine, Virginia pine.
44F*:								
Lehew [South aspect]	4r	Moderate	Severe	Moderate	Slight	Northern red oak Virginia pine	58 58	Eastern white pine, Virginia pine.
Dekalb [South aspect	3r	Moderate	Severe	Slight	Slight	Northern red oak Black cherry Yellow-poplar	66 66 80	Eastern white pine, Virginia pine.
Calvin [South aspect]	3f	Moderate	Severe	Severe	Slight	Northern red oak	67	Eastern white pine
45A Massanetta	2w	Slight	Moderate	Slight	Slight	Northern red oak Virginia pine Sweetgum	85 85 95	Black walnut, eastern white pine, yellow-poplar.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
46A---------- Millrock	2s	Slight	Slight	Moderate	Slight	White oak----------	80	Black walnut, eastern white pine, Scotch pine**.
						Northern red oak----	80	
						Yellow-poplar-------	95	
						Eastern white pine--	95	
47B---------- Monongahela	3r	Slight	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine, yellow-poplar.
						Yellow-poplar-------	85	
						Eastern white pine--	76	
						Virginia pine-------	66	
						White ash----------	---	
						Black walnut--------	---	
47C2---------- Monongahela	3o	Moderate	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine, yellow-poplar.
						Yellow-poplar-------	85	
						Eastern white pine--	76	
						Virginia pine-------	66	
						White ash----------	---	
						Black walnut--------	---	
48B---------- Monongahela	3o	Slight	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine, yellow-poplar.
						Yellow-poplar-------	85	
						Eastern white pine--	76	
						Virginia pine-------	66	
						White ash----------	---	
						Black walnut--------	---	
48C---------- Monongahela	3r	Moderate	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine, yellow-poplar.
						Yellow-poplar-------	85	
						Eastern white pine--	76	
						Virginia pine-------	66	
						White ash----------	---	
						Black walnut--------	---	
49C---------- Myersville	1o	Slight	Slight	Slight	Slight	Northern red oak----	86	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	
49D---------- Myersville	1r	Moderate	Moderate	Slight	Slight	Northern red oak----	86	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	
49F---------- Myersville	1r	Severe	Severe	Slight	Slight	Northern red oak----	86	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	
50B*, 50C*:								
Nixa----------	4f	Slight	Slight	Moderate	Moderate	Shortleaf pine------	60	Shortleaf pine, black locust, Northern red oak.
						Northern red oak----	60	
						White oak----------	60	
						Black walnut--------	---	
						Black locust--------	---	
Frederick---------	2c	Slight	Moderate	Slight	Slight	Northern red oak----	76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**.
						Yellow-poplar-------	86	
						Black locust--------	---	
Lodi----------	2c	Slight	Moderate	Slight	Slight	Northern red oak----	76	Eastern white pine, yellow-poplar, white oak, black walnut, Scotch pine**.
						Yellow-poplar-------	86	
						White oak----------	76	
54A---------- Purdy	1w	Slight	Severe	Severe	Severe	Shortleaf pine------	86	Virginia pine, eastern white pine.
						Virginia pine-------	86	
						Yellow-poplar-------	96	
						Sweetgum-----------	96	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
55C*:								
Rock outcrop.								
Carbo	3c	Slight	Moderate	Moderate	Slight	Northern red oak Yellow-poplar Eastern white pine	70 80 80	Eastern white pine, yellow-poplar, black walnut.
56C*:								
Rock outcrop.								
Frederick	2c	Slight	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar.
56D*:								
Rock outcrop.								
Frederick	2c	Moderate	Moderate	Slight	Slight	Northern red oak Yellow-poplar Black locust White oak Black walnut	76 86 --- --- ---	Eastern white pine, yellow-poplar.
58B2, 58C2 Sequoia	3o	Slight	Slight	Slight	Slight	Northern red oak Shortleaf pine Virginia pine	70 66 75	Shortleaf pine, Eastern white pine.
59B2*, 59C2*:								
Sequoia	3o	Slight	Slight	Slight	Slight	Northern red oak Shortleaf pine Virginia pine	70 73 71	Shortleaf pine, Virginia pine, Eastern white pine.
Berks	3f	Slight	Slight	Moderate	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, eastern white pine.
59D2*:								
Sequoia	3r	Moderate	Moderate	Slight	Slight	Northern red oak Shortleaf pine Virginia pine	70 66 71	Shortleaf pine, Virginia pine, Eastern white pine.
Berks	3f	Slight	Moderate	Moderate	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, Eastern white pine,
60C*:								
Sequoia	3o	Slight	Slight	Slight	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, eastern white pine, red pine***.
Berks	3f	Slight	Slight	Moderate	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, eastern white pine, red pine***.
60D Sequoia	3r	Moderate	Moderate	Slight	Slight	Northern red oak Virginia pine Shortleaf pine	70 71 66	Eastern white pine, shortleaf pine.
Berks [North aspect]	3f	Slight	Moderate	Moderate	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, Eastern white pine.
60D Sequoia	3r	Moderate	Moderate	Slight	Slight	Northern red oak Virginia pine Shortleaf pine	70 71 66	Eastern white pine, shortleaf pine.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
60D---------- Berks [South aspect]	4f	Slight	Moderate	Severe	Slight	Northern red oak----	60	Virginia pine, eastern white pine.
						Virginia pine-------	60	
						Black oak-----------	60	
61B, 62C---------- Shelocta Variant	2o	Slight	Slight	Slight	Slight	Northern red oak----	85	Yellow-poplar, eastern white pine.
						Yellow-poplar-------	86	
						Sugar maple---------	76	
63B, 63C2---------- Shenval	1o	Slight	Slight	Slight	Slight	Northern red oak----	90	Eastern white pine, black walnut, yellow-poplar, Scotch pine**.
						Yellow-poplar-------	96	
						Eastern white pine--	96	
63D2---------- Shenval	1r	Moderate	Moderate	Slight	Slight	Northern red oak----	90	Eastern white pine, black walnut, yellow-poplar, Scotch pine**.
						Yellow-poplar-------	96	
						Eastern white pine--	96	
64C---------- Sherando	2o	Slight	Slight	Slight	Slight	Northern red oak----	80	Yellow-poplar, shortleaf pine, eastern white pine.
						Yellow-poplar-------	95	
						Virginia pine-------	80	
						Shortleaf pine------	80	
64D---------- Sherando	2f	Slight	Moderate	Moderate	Slight	Northern red oak----	80	Yellow-poplar, shortleaf pine, eastern white pine.
						Yellow-poplar-------	95	
						Virginia pine-------	80	
						Shortleaf pine------	80	
65B2, 65C2---------- Swimley	2c	Slight	Moderate	Slight	Slight	Northern red oak----	80	Eastern white pine, yellow-poplar, Scotch pine**.
						Yellow-poplar-------	90	
66D---------- Sylco	4r	Slight	Moderate	Slight	Slight	Shortleaf pine------	60	Eastern white pine, shortleaf pine.
						Virginia pine-------	60	
66E, 67F---------- Sylco	4r	Moderate	Severe	Slight	Slight	Eastern white pine--	70	Virginia pine, Eastern white pine.
						Black oak-----------	60	
68B---------- Timberville Variant	2o	Slight	Slight	Slight	Slight	Yellow-poplar-------	90	Yellow-poplar, black walnut, eastern white pine.
						Northern red oak----	80	
						Shortleaf pine------	80	
						Virginia pine-------	76	
69A---------- Tioga	2o	Slight	Slight	Slight	Slight	Northern red oak----	76	Eastern white pine, yellow-poplar, Norway spruce**, black walnut, European larch**.
						Yellow-poplar-------	86	
						Sugar maple---------	76	
71B2, 71C2---------- Unison	1o	Slight	Slight	Slight	Slight	Northern red oak----	86	Yellow-poplar, black walnut, eastern white pine, Scotch pine**.
						Yellow-poplar-------	96	
						Virginia pine-------	86	
72B2, 72C2---------- Unison	1o	Slight	Slight	Slight	Slight	Northern red oak----	86	Yellow-poplar, black walnut, eastern white pine, Scotch pine**.
						Yellow-poplar-------	96	
						Virginia pine-------	86	
72D2---------- Unison	1r	Slight	Moderate	Slight	Slight	Northern red oak----	86	Yellow-poplar, black walnut, eastern white pine.
						Yellow-poplar-------	96	
						Virginia pine-------	86	
74E2*: Weikert---------- [North aspect]	4d	Moderate	Severe	Severe	Moderate	Northern red oak----	64	Eastern white pine, shortleaf pine, Virginia pine.
						Virginia pine-------	60	
Berks---------- [North aspect]	3f	Moderate	Severe	Moderate	Slight	Northern red oak----	70	Virginia pine, eastern white pine.
						Black oak-----------	70	
						Virginia pine-------	70	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
74E2*:								
Weikert [South aspect]	5d	Moderate	Severe	Severe	Moderate	Northern red oak Virginia pine	55 52	Virginia pine, shortleaf pine.
Berks [South aspect]	4f	Moderate	Severe	Moderate	Slight	Northern red oak Black oak Virginia pine	60 60 60	Virginia pine, eastern white pine.
74F2*:								
Weikert [North aspect]	4d	Moderate	Severe	Severe	Moderate	Northern red oak Virginia pine	64 60	Eastern white pine, shortleaf pine, Virginia pine.
Berks [North aspect]	3f	Moderate	Severe	Moderate	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, eastern white pine.
74F2*:								
Weikert [South aspect]	5d	Moderate	Severe	Severe	Moderate	Northern red oak Virginia pine	55 52	Virginia pine, shortleaf pine.
Berks [South aspect]	4f	Moderate	Severe	Moderate	Slight	Northern red oak Black oak Virginia pine	60 60 60	Virginia pine, eastern white pine.
75E2*:								
Weikert [North aspect]	4d	Moderate	Severe	Severe	Moderate	Northern red oak Virginia pine	64 60	Eastern white pine, shortleaf pine, Virginia pine.
Berks [North aspect]	3f	Moderate	Severe	Moderate	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, eastern white pine.
75E2*:								
Weikert [South aspect]	5d	Moderate	Severe	Severe	Moderate	Northern red oak Virginia pine	55 52	Virginia pine, shortleaf pine.
Berks [South aspect]	4f	Moderate	Severe	Severe	Slight	Northern red oak Black oak Virginia pine	60 60 60	Virginia pine, eastern white pine.
75F2*:								
Weikert [North aspect]	4d	Moderate	Severe	Severe	Moderate	Northern red oak Virginia pine	64 60	Eastern white pine, shortleaf pine, Virginia pine.
Berks [North aspect]	3f	Moderate	Severe	Moderate	Slight	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, eastern white pine.
75F2*:								
Weikert [South aspect]	5d	Moderate	Severe	Severe	Moderate	Northern red oak Virginia pine	55 52	Virginia pine, shortleaf pine.
Berks [South aspect]	4f	Moderate	Severe	Severe	Slight	Northern red oak Black oak Virginia pine	60 60 60	Virginia pine, eastern white pine.
76A Wheeling	2o	Slight	Slight	Slight	Slight	Northern red oak Yellow-poplar	80 90	Eastern white pine, yellow-poplar, black walnut, Scotch pine**.

* See description of the map unit for composition and behavior characteristics of the map unit.
** Christmas tree species.
*** For plantings at an elevation of more than 1,800 feet.

TABLE 7.--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
1B Allegheny	Slight	Slight	Moderate: slope, small stones.	Slight.
2B Allegheny	Moderate: small stones, large stones.	Moderate: large stones, small stones.	Severe: large stones, small stones.	Moderate: large stones.
3B*: Allegheny	Slight	Slight	Moderate: slope, small stones.	Slight.
Monongahela	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Severe: erodes easily.
4A*. Aquic Udifluvents				
5C2*: Berks	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: small stones, slope.	Slight.
Weikert	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Slight.
5D2*: Berks	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Moderate: slope.
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Moderate: slope.
6C2*: Berks	Severe: small stones.	Severe: small stones.	Severe: small stones, slope.	Slight.
Weikert	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Slight.
6D2*: Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.	Moderate: slope.
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Moderate: slope.
7A Buchanan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
8B Buchanan	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.
8C Buchanan	Severe: wetness.	Severe: wetness.	Severe: slope, small stones, wetness.	Severe: wetness.
9C Buchanan	Severe: wetness.	Severe: wetness.	Severe: large stones, slope, small stones.	Severe: wetness.
10A Buckton	Severe: flooding.	Slight	Moderate: slope, flooding.	Slight.
11B Burketown	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Severe: slope.	Slight.
12B*: Carbo	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, depth to rock.	Severe: erodes easily.
Endcav	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
Rock outcrop.				
12C*: Carbo	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
Endcav	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
Rock outcrop.				
13A Chavies	Severe: floods.	Slight	Slight	Slight.
14B2 Chilhowie	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
14C2 Chilhowie	Severe: too clayey.	Severe: too clayey.	Severe: slope, too clayey.	Severe: too clayey.
14D2 Chilhowie	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: too clayey.
15B2 Chilhowie	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
15C2 Chilhowie	Severe: too clayey.	Severe: too clayey.	Severe: slope, too clayey.	Severe: too clayey.
15D2 Chilhowie	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: too clayey.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
16E3 Chilhowie	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.
17B2*: Chilhowie	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight.
Edom	Slight	Slight	Moderate: slope.	Slight.
17C2*: Chilhowie	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
Edom	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
17D2*: Chilhowie	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Edom	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
18B Cotaco	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: wetness.
19B Cotaco	Moderate: large stones, small stones.	Moderate: wetness, large stones.	Severe: large stones, small stones.	Moderate: large stones, wetness.
20B Cotaco Variant	Moderate: large stones, wetness, percs slowly.	Moderate: large stones, wetness, percs slowly.	Severe: large stones, wetness, percs slowly.	Moderate: large stones, dusty.
21B Craigsville	Severe: flooding.	Moderate: flooding, large stones.	Severe: flooding.	Moderate: large stones, flooding.
22F Drall	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: large stones, small stones, slope.
23B2 Edom	Slight	Slight	Moderate: slope.	Slight.
23C2 Edom	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
23D2 Edom	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
24B2 Endcav	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
24C2 Endcav	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
25B2 Endcav	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
25C2---------- Endcav	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
26C2---------- Fauquier	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
26D2---------- Fauquier	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
27E---------- Fauquier	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.
28A*. Fluvaquents				
29B2*: Frederick----------	Slight----------	Slight----------	Moderate: slope.	Slight.
Lodi----------	Slight----------	Slight----------	Moderate: slope, small stones.	Slight.
29C2*: Frederick----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Lodi----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
29D2*: Frederick----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Lodi----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
29E2*: Frederick----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lodi----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
30C3*: Frederick----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: too clayey.
Lodi----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: too clayey.
30D3*: Frederick----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too clayey, slope.
Lodi----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too clayey, slope.
31B2*: Frederick----------	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight:

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
31B2*:				
Lodi	Slight	Slight	Moderate: slope, small stones.	Slight.
31C2*:				
Frederick	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
Lodi	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight:
31D2*:				
Frederick	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
31E2*:				
Frederick	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
32C*:				
Frederick	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight.
Lodi	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight:
32D*:				
Frederick	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
32E*:				
Frederick	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
33B2*:				
Frederick	Slight	Slight	Moderate: slope.	Slight.
Lodi	Slight	Slight	Moderate: slope, small stones.	Slight.
33C2*:				
Frederick	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
33C2*:				
Lodi	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
33D2*:				
Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
33E2*:				
Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
34C*:				
Frederick	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Rock outcrop.				
34E*:				
Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.				
35B Guernsey	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.
36B Hawksbill	Severe: flooding.	Moderate: flooding, small stones.	Severe: large stones, flooding.	Severe: large stones.
37B Hawksbill	Severe: flooding, large stones.	Severe: large stones.	Severe: large stones, flooding.	Severe: large stones.
38C Hawksbill	Severe: flooding, large stones.	Severe: large stones.	Severe: large stones, slope.	Severe: large stones.
39B Laidig	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
39C Laidig	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
40B Laidig	Moderate: large stones.	Moderate: large stones.	Severe: large stones.	Slight.
40C Laidig	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Slight.
40D Laidig	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: slope.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
40E Laidig	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.
41C Laidig	Moderate: slope, large stones, small stones.	Moderate: slope, small stones, large stones.	Severe: slope, large stones, small stones.	Slight.
41D Laidig	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Moderate: slope.
41E Laidig	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.
42C*: Laidig	Severe: large stones.	Severe: large stones.	Severe: slope, large stones, small stones.	Slight.
Buchanan	Severe: large stones, wetness.	Severe: wetness, large stones.	Severe: large stones, slope, small stones.	Severe: wetness.
43C*: Lehew	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Moderate: large stones.
Dekalb	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Moderate: large stones.
Calvin	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Moderate: large stones.
43D*: Lehew	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: slope, large stones.
Dekalb	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: slope, large stones.
Calvin	Severe: slope.	Severe: slope.	Severe: slope, large stones	Moderate: slope, large stones.
44E*: Lehew	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Moderate: slope, large stones.
Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Moderate: slope, large stones.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
44E*: Calvin	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Moderate: slope, large stones.
44F*: Lehew	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope.
Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope.
Calvin	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.
45A Massanetta	Severe: flooding.	Moderate: wetness.	Moderate: flooding, wetness.	Slight.
46A Millrock	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
47B Monongahela	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Severe: erodes easily.
47C2 Monongahela	Moderate: wetness, slope.	Moderate: slope, wetness.	Severe: slope.	Severe: erodes easily.
48B Monongahela	Moderate: small stones, wetness.	Moderate: small stones, wetness.	Severe: small stones.	Severe: erodes easily.
48C Monongahela	Moderate: slope, small stones, wetness.	Moderate: slope, small stones, wetness.	Severe: slope, small stones.	Severe: erodes easily.
49C Myersville	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Slight.
49D Myersville	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: slope.
49F Myersville	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.
50B*: Nixa	Severe: small stones, percs slowly.	Severe: small stones, percs slowly.	Severe: small stones, percs slowly.	Severe: erodes easily, small stones.
Frederick	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
Lodi	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
50C*:				
Nixa	Severe: small stones, percs slowly.	Severe: small stones, percs slowly.	Severe: slope, small stones, percs slowly.	Severe: erodes easily, small stones.
Frederick	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.
Lodi	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
51*, 52*. Pits				
53*. Pits and dumps				
54A Purdy	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.
55C*: Rock outcrop.				
Carbo	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
56C*: Rock outcrop.				
Frederick	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
56D*: Rock outcrop.				
Frederick	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
57E*: Rock outcrop.				
Laidig	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones, small stones.	Moderate: slope.
58B2 Sequoia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, depth to rock, percs slowly.	Severe: erodes easily.
58C2 Sequoia	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
59B2*: Sequoia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, depth to rock, percs slowly.	Severe: erodes easily.
Berks	Slight	Slight	Severe: small stones.	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
59C2*:				
Sequoia	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
Berks	Moderate: slope.	Moderate: slope.	Severe: small stones, slope.	Slight.
59D2*:				
Sequoia	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Berks	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Moderate: slope.
60C*:				
Sequoia	Moderate: percs slowly.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Berks	Severe: small stones.	Severe: small stones.	Severe: small stones, slope.	Slight.
60D*:				
Sequioa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.	Moderate: slope.
61B---- Shelocta Variant	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight.
62C---- Shelocta Variant	Moderate: large stones, small stones, slope.	Moderate: large stones, small stones, slope.	Severe: slope, large stones.	Moderate: large stones.
63B---- Shenval	Slight	Slight	Moderate: slope, small stones.	Slight.
63C2---- Shenval	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
63D2---- Shenval	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
64C---- Sherando	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Moderate: large stones.
64D---- Sherando	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.
65B2---- Swimley	Slight	Slight	Moderate: slope, small stones.	Slight.
65C2---- Swimley	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
66D---------- Sylco	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Moderate: slope.
66E---------- Sylco	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Severe: slope.
67F---------- Sylco	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.
68B---------- Timberville Variant	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
69A---------- Tioga	Severe: flooding.	Slight----------	Slight----------	Slight.
70A*. Typic Udorthents				
71B2---------- Unison	Slight----------	Slight----------	Moderate: slope, small stones.	Slight.
71C2---------- Unison	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
72B2---------- Unison	Moderate: large stones.	Moderate: large stones.	Severe: large stones.	Moderate: large stones.
72C2---------- Unison	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Moderate: large stones.
72D2---------- Unison	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: large stones, slope.
73*. Urban land				
74E2*, 74F2*: Weikert----------	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Severe: slope.
Berks----------	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Severe: slope.
75E2*, 75F2*: Weikert----------	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Severe: slope.
Berks----------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.	Severe: slope.
76A---------- Wheeling	Severe: flooding.	Slight----------	Moderate: slope.	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1B, 2B---------- Allegheny	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
3B*:										
Allegheny---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Monongahela-------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
4A*. Aquic Udifluvents										
5C2*:										
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.
5D2*:										
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.
6C2*, 6D2*:										
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.
7A---------- Buchanan	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
8B---------- Buchanan	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8C---------- Buchanan	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
9C---------- Buchanan	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
10A---------- Buckton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
11B---------- Burketown	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
12B*:										
Carbo----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Endcav----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Rock outcrop.										

See footnote at end of table.

TABLE 8.--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
12C*:										
Carbo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Endcav	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rock outcrop.										
13A Chavies	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
14B2 Chilhowie	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Poor	Very poor.
14C2, 14D2 Chilhowie	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
15B2 Chilhowie	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Poor	Very poor.
15C2, 15D2 Chilhowie	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
16E3 Chilhowie	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
17B2*:										
Chilhowie	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Poor	Very poor.
Edom	Fair	Good	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
17C2*:										
Chilhowie	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
Edom	Fair	Good	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
17D2*:										
Chilhowie	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
Edom	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
18B Cotaco	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
19B Cotaco	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
20B Cotaco Variant	Fair	Good	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
21B Craigsville	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
22F Drall	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
23B2 Edom	Fair	Good	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 8.--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
23C2---------- Edom	Fair	Good	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
23D2---------- Edom	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
24B2---------- Endcav	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
24C2---------- Endcav	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
25B2---------- Endcav	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
25C2---------- Endcav	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
26C2, 26D2--------- Fauquier	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
27E---------- Fauquier	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
28A*. Fluvaquents										
29B2*: Frederick---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Lodi----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
29C2*: Frederick---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Lodi----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
29D2*: Frederick---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi----------	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
29E2*: Frederick---------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
30C3*: Frederick---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Lodi----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
30D3*: Frederick---------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 8.--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
30D3*:										
Lodi	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
31B2*:										
Frederick	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Lodi	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
31C2*:										
Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Lodi	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
31D2*:										
Frederick	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
31E2*:										
Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
32C*:										
Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Lodi	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
32D*:										
Frederick	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
32E*:										
Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
33B2*:										
Frederick	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Lodi	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
33C2*:										
Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Lodi	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--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
33D2*:										
Frederick	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
33E2*:										
Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lodi	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
34C*:										
Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rock outcrop.										
34E*:										
Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
35B---------- Guernsey	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
36B---------- Hawksbill	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
37B---------- Hawksbill	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Poor.
38C---------- Hawksbill	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
39B---------- Laidig	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
39C---------- Laidig	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
40B---------- Laidig	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
40C---------- Laidig	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
40D---------- Laidig	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
40E, 41C, 41D, 41E- Laidig	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
42C*:										
Laidig	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Buchanan	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
43C*:										
Lehew	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.

See footnote at end of table.

TABLE 8.--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
43C*:										
Dekalb	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Calvin	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
43D*:										
Lehew	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Dekalb	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Calvin	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
44E*:										
Lehew	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
44F*:										
Lehew	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Calvin	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
45A Massanetta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
46A Millrock	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
47B Monongahela	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
47C2 Monongahela	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
48B Monongahela	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
48C Monongahela	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
49C, 49D Myersville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
49F Myersville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
50B*:										
Nixa	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.

See footnote at end of table.

TABLE 8.--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
50B*:										
Frederick	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Lodi	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
50C*:										
Nixa	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Lodi	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
51*, 52*. Pits										
53*. Pits and dumps										
54A Purdy	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
55C*:										
Rock outcrop.										
Carbo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
56C*:										
Rock outcrop.										
Frederick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
56D*:										
Rock outcrop.										
Frederick	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
57E*:										
Rock outcrop.										
Laidig	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
58B2 Sequoia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
58C2 Sequoia	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
59B2*:										
Sequoia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Berks.										
59C2*:										
Sequoia	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--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
59C2*: Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
59D2*: Sequoia	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
60C*, 60D*: Sequoia	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
61B--- Shelocta Variant	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
62C--- Shelocta Variant	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
63B--- Shenval	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
63C2--- Shenval	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
63D2--- Shenval	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
64C--- Sherando	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
64D--- Sherando	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
65B2--- Swimley	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
65C2--- Swimley	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
66D, 66E--- Sylco	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
67F--- Sylco	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
68B--- Timberville Variant	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
69A--- Tioga	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
70A*. Typic Udorthents										
71B2--- Unison	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
71C2--- Unison	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--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
72B2---------- Unison	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
72C2---------- Unison	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
72D2---------- Unison	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
73*. Urban land										
74E2*, 74F2*, 75E2*, 75F2*: Weikert----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Berks----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
76A---------- Wheeling	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 9.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1B---------- Allegheny	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: low strength.	Slight.
2B---------- Allegheny	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: low strength.	Moderate: small stones, large stones.
3B*:						
Allegheny--------	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: low strength.	Slight.
Monongahela------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Slight.
4A*. Aquic Udifluvents						
5C2*:						
Berks----------	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Severe: small stones.
Weikert----------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, frost action.	Severe: thin layer, small stones.
5D2*:						
Berks----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Weikert----------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, thin layer, small stones.
6C2*:						
Berks----------	Moderate: slope, depth to rock, large stones.	Moderate: large stones, slope.	Moderate: depth to rock, large stones, slope.	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: slope, depth to rock, frost action.	Severe: small stones, thin layer.
6D2*:						
Berks----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Weikert----------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones, thin layer.
7A---------- Buchanan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
8B---------- Buchanan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.

See footnote at end of table.

TABLE 9.--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
8C, 9C---------- Buchanan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: wetness.	Severe: small stones, wetness.
10A---------- Buckton	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
11B---------- Burketown	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: frost action, wetness.	Slight.
12B*: Carbo----------	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: thin layer.
Endcav----------	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
Rock outcrop.						
12C*: Carbo----------	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope, thin layer.
Endcav----------	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
Rock outcrop.						
13A---------- Chavies	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
14B2---------- Chilhowie	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
14C2---------- Chilhowie	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Severe: too clayey.
14D2---------- Chilhowie	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope, too clayey.
15B2---------- Chilhowie	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
15C2---------- Chilhowie	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Severe: too clayey.
15D2, 16E3-------- Chilhowie	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope, too clayey.
17B2*: Chilhowie--------	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: thin layer.

See footnote at end of table.

TABLE 9.--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
17B2*:						
Edom	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: too clayey.
17C2*:						
Chilhowie	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: thin layer, slope.
Edom	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, too clayey.
17D2*:						
Chilhowie	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
Edom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
18B--- Cotaco	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Moderate: wetness.
19B--- Cotaco	Severe: wetness.	Moderate: wetness, large stones.	Severe: wetness.	Moderate: wetness, large stones.	Moderate: wetness, large stones.	Severe: large stones.
20B--- Cotaco Variant	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Severe: large stones.
21B--- Craigsville	Severe: cutbanks cave, large stones.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
22F--- Drall	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, large stones, droughty.
23B2--- Edom	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: too clayey.
23C2--- Edom	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, too clayey.
23D2--- Edom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
24B2--- Endcav	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
24C2--- Endcav	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
25B2--- Endcav	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.

See footnote at end of table.

TABLE 9.--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
25C2---------- Endcav	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
26C2---------- Fauquier	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, small stones.
26D2, 27E--------- Fauquier	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
28A*. Fluvaquents						
29B2*: Frederick--------	Moderate: too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
Lodi----------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
29C2*: Frederick--------	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Lodi----------	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
29D2*, 29E2*: Frederick--------	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Lodi----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
30C3*: Frederick--------	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Lodi----------	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
30D3*: Frederick--------	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Lodi----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
31B2*: Frederick--------	Moderate: too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: small stones.
Lodi----------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 9.--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
31C2*:						
Frederick	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, shrink-swell.	Moderate: slope, small stones.
Lodi	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
31D2*, 31E2*:						
Frederick	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope, shrink-swell.	Severe: slope, small stones.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
32C*:						
Frederick	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, shrink-swell.	Severe: small stones.
Lodi	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
32D*, 32E*:						
Frederick	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope, shrink-swell.	Severe: slope, small stones.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
33B2*:						
Frederick	Moderate: too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
Lodi	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
33C2*:						
Frederick	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Lodi	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
33D2*, 33E2*:						
Frederick	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
34C*:						
Frederick	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.

See footnote at end of table.

TABLE 9.--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
34C*: Rock outcrop.						
34E*: Frederick	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop.						
35B---- Guernsey	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Slight.
36B---- Hawksbill	Severe: large stones.	Severe: flooding.	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: flooding, large stones.	Moderate: small stones, droughty, flooding.
37B---- Hawksbill	Severe: large stones.	Severe: flooding.	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: large stones.
38C---- Hawksbill	Severe: large stones.	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: flooding, large stones, slope.	Severe: flooding, large stones.	Severe: large stones.
39B---- Laidig	Moderate: wetness.	Slight----	Moderate: wetness.	Moderate: slope.	Moderate: frost action, low strength.	Moderate: small stones.
39C---- Laidig	Moderate: wetness, slope.	Moderate: slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope, frost action, low strength.	Moderate: small stones, slope.
40B---- Laidig	Moderate: wetness.	Slight----	Moderate: wetness.	Moderate: slope.	Moderate: frost action, low strength.	Moderate: large stones.
40C---- Laidig	Moderate: wetness, slope.	Moderate: slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope, frost action, low strength.	Moderate: large stones, slope.
40D, 40E---- Laidig	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
41C---- Laidig	Moderate: slope, wetness.	Moderate: slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope, low strength, frost action.	Moderate: slope, large stones, small stones.
41D, 41E---- Laidig	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
42C*: Laidig	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action, low strength.	Moderate: large stones, small stones, slope.
Buchanan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: wetness.	Severe: small stones, wetness.

See footnote at end of table.

TABLE 9.--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
43C*:						
Lehew	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, large stones, droughty.
Dekalb	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, slope.
Calvin	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope, thin layer.
43D*:						
Lehew	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
44E*, 44F*:						
Lehew	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
45A Massanetta	Severe: wetness.	Severe: flooding.	Severe: wetness, flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
46A Millrock	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, droughty.
47B Monongahela	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
47C2 Monongahela	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: slope, low strength, wetness.	Moderate: slope.
48B Monongahela	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: large stones.
48C Monongahela	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: slope, low strength, wetness.	Moderate: slope, large stones.
49C Myersville	Moderate: slope.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.

See footnote at end of table.

TABLE 9.--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
49D, 49F---------- Myersville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
50B*:						
Nixa----------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: small stones.
Frederick--------	Moderate: too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: small stones.
Lodi----------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
50C*:						
Nixa----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
Frederick--------	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, shrink-swell.	Moderate: slope, small stones.
Lodi----------	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
51*, 52*. Pits						
53*. Pits and dumps						
54A---------- Purdy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength, frost action.	Severe: wetness.
55C*: Rock outcrop.						
Carbo----------	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope, thin layer.
56C*: Rock outcrop.						
Frederick--------	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
56D*: Rock outcrop.						
Frederick--------	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
57E*: Rock outcrop.						
Laidig----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
58B2---------- Sequoia	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: thin layer.

See footnote at end of table.

TABLE 9.--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
58C2---------- Sequoia	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
59B2*:						
Sequoia----------	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: thin layer.
Berks----------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Slight---------	Severe: small stones.
59C2*:						
Sequoia----------	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
Berks----------	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Severe: small stones.
59D2*:						
Sequoia----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Berks----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
60C*:						
Sequoia----------	Moderate: slope, too clayey, depth to rock.	Moderate: slope, shrink-swell.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
Berks----------	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
60D*:						
Sequoia----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
Berks----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
61B---------- Shelocta Variant	Moderate: too clayey, large stones.	Moderate: shrink-swell, large stones.	Moderate: shrink-swell, large stones.	Moderate: shrink-swell, large stones.	Severe: low strength.	Severe: small stones.
62C---------- Shelocta Variant	Moderate: large stones, too clayey, slope.	Moderate: large stones, shrink-swell, slope.	Moderate: large stones, shrink-swell, slope.	Severe: slope.	Severe: low strength.	Severe: small stones.
63B---------- Shenval	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
63C2---------- Shenval	Moderate: too clayey, slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.

See footnote at end of table.

TABLE 9.--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
63D2--- Shenval	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
64C--- Sherando	Severe: cutbanks cave.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: large stones.
64D--- Sherando	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
65B2--- Swimley	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
65C2--- Swimley	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
66D, 66E, 67F--- Sylco	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
68B--- Timberville Variant	Moderate: too clayey, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
69A--- Tioga	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
70A*. Typic Udorthents						
71B2--- Unison	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Moderate: large stones.
71C2--- Unison	Moderate: too clayey, slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
72B2--- Unison	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: large stones.
72C2--- Unison	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
72D2--- Unison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
73*. Urban land						
74E2*, 74F2*: Weikert---	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, thin layer, small stones.
Berks---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.

See footnote at end of table.

TABLE 9.--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
75E2*, 75F2*: Weikert	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones, thin layer.
Berks	Severe: slope.	Severe: slope.	Severe	Severe: slope.	Severe: slope.	Severe: slope, small stones.
76A Wheeling	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action, low strength.	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1B---- Allegheny	Slight----	Moderate: slope, seepage.	Severe: seepage.	Slight----	Fair: too clayey.
2B---- Allegheny	Slight----	Moderate: slope, seepage.	Severe: seepage.	Slight----	Poor: small stones.
3B*: Allegheny----	Slight----	Moderate: slope, seepage.	Severe: seepage.	Slight----	Fair: too clayey.
Monongahela----	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
4A*. Aquic Udifluvents					
5C2*: Berks----	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
Weikert----	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: area reclaim, seepage, small stones.
5D2*: Berks----	Severe: depth to rock, slope.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, area reclaim.
Weikert----	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, area reclaim, seepage.
6C2*: Berks----	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
Weikert----	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: area reclaim, seepage, small stones.
6D2*: Berks----	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, area reclaim.
Weikert----	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, area reclaim, seepage.

See footnote at end of table.

TABLE 10.--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
7A, 8B---------- Buchanan	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
8C, 9C---------- Buchanan	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
10A---------- Buckton	Severe: flooding.	Severe: seepage, flooding.	Severe: seepage, flooding.	Severe: flooding.	Fair: too clayey, thin layer.
11B---------- Burketown	Severe: wetness, percs slowly.	Severe: wetness, seepage.	Severe: seepage.	Severe: seepage.	Fair: wetness, thin layer.
12B*: Carbo----------	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Endcav----------	Severe: percs slowly.	Moderate: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
Rock outcrop.					
12C*: Carbo----------	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Endcav----------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
Rock outcrop.					
13A---------- Chavies	Moderate: flooding.	Severe: seepage, flooding.	Severe: seepage.	Severe: seepage.	Good.
14B2---------- Chilhowie	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
14C2---------- Chilhowie	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
14D2---------- Chilhowie	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: area reclaim, too clayey, hard to pack.
15B2---------- Chilhowie	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
15C2---------- Chilhowie	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.

See footnote at end of table.

TABLE 10.--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
15D2, 16E3---------- Chilhowie	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: area reclaim, too clayey, hard to pack.
17B2*: Chilhowie----------	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Edom----------	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
17C2*: Chilhowie----------	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Edom----------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
17D2*: Chilhowie----------	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: area reclaim, too clayey, hard to pack.
Edom----------	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
18B---------- Cotaco	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: small stones, wetness.
19B---------- Cotaco	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, large stones.	Severe: seepage, wetness.	Poor: small stones.
20B---------- Cotaco Variant	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
21B---------- Craigsville	Severe: flooding, poor filter.	Severe: seepage, flooding, large stones.	Severe: flooding, seepage, large stones.	Severe: flooding, seepage.	Poor: large stones, seepage.
22F---------- Drall	Severe: slope, poor filter.	Severe: seepage, slope, large stones.	Severe: seepage, depth to rock, slope.	Severe: slope, seepage.	Poor: seepage, too sandy, small stones.
23B2---------- Edom	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
23C2---------- Edom	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 10.--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
23D2---------- Edom	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
24B2---------- Endcav	Severe: percs slowly.	Moderate: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
24C2---------- Endcav	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
25B2---------- Endcav	Severe: percs slowly.	Moderate: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
25C2---------- Endcav	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
26C2---------- Fauquier	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack, small stones.
26D2, 27E---------- Fauquier	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, small stones.
28A*. Fluvaquents					
29B2*: Frederick----------	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
Lodi----------	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
29C2*: Frederick----------	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Lodi----------	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
29D2*, 29E2*: Frederick----------	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Lodi----------	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
30C3*: Frederick----------	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 10.--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
30C3*:					
Lodi	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
30D3*:					
Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
31B2*:					
Frederick	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey.
Lodi	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
31C2*:					
Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
Lodi	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
31D2*:					
Frederick	Severe: slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope, too clayey.
Lodi	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
31E2*:					
Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, too clayey.
Lodi	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
32C*:					
Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
Lodi	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
32D*:					
Frederick	Severe: slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope, too clayey.

See footnote at end of table.

TABLE 10.--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
32D*:					
Lodi	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
32E*:					
Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, too clayey.
Lodi	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
33B2*:					
Frederick	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Lodi	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
33C2*:					
Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Lodi	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
33D2*, 33E2*:					
Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Lodi	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
34C*:					
Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Rock outcrop.					
34E*:					
Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Rock outcrop.					
35B---------- Guernsey	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, too clayey.	Moderate: depth to rock, wetness.	Poor: too clayey, hard to pack.
36B---------- Hawksbill	Severe: flooding.	Severe: flooding.	Severe: seepage, flooding, large stones.	Severe: flooding, seepage.	Poor: large stones.

See footnote at end of table.

TABLE 10.--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
37B Hawksbill	Severe: large stones.	Severe: flooding, large stones.	Severe: seepage, flooding, large stones.	Severe: flooding, seepage.	Poor: large stones.
38C Hawksbill	Severe: flooding, large stones.	Severe: flooding, large stones.	Severe: flooding, seepage, large stones.	Severe: flooding, seepage.	Poor: large stones.
39B Laidig	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Severe: seepage.	Fair: small stones, wetness.
39C Laidig	Severe: percs slowly, wetness.	Severe: seepage, slope, wetness.	Moderate: slope, wetness.	Severe: seepage.	Fair: slope, small stones, wetness.
40B Laidig	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Severe: seepage.	Fair: small stones, wetness.
40C Laidig	Severe: percs slowly, wetness.	Severe: seepage, slope, wetness.	Moderate: slope, wetness.	Severe: seepage.	Fair: slope, small stones, wetness.
40D, 40E Laidig	Severe: slope, percs slowly, wetness.	Severe: seepage, slope, wetness.	Severe: slope.	Severe: slope, seepage.	Poor: slope.
41C Laidig	Severe: percs slowly, wetness.	Severe: seepage, slope, wetness.	Moderate: slope, wetness.	Severe: seepage.	Fair: slope, small stones, wetness.
41D, 41E Laidig	Severe: slope, percs slowly, wetness.	Severe: seepage, slope, wetness.	Severe: slope.	Severe: slope, seepage.	Poor: slope.
42C*: Laidig	Severe: percs slowly, wetness.	Severe: seepage, slope, wetness.	Moderate: wetness, slope, large stones.	Severe: seepage.	Fair: slope, small stones, wetness.
Buchanan	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
43C*: Lehew	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
Dekalb	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
Calvin	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones.

See footnote at end of table.

TABLE 10.--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
43D*:					
Lehew	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, area reclaim.
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, area reclaim.
Calvin	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
44E*, 44F*:					
Lehew	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, area reclaim.
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, area reclaim.
Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
45A Massanetta	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: flooding, wetness.	Severe: wetness, flooding.	Fair: too clayey, small stones, wetness.
46A Millrock	Severe: flooding, poor filter.	Severe: flooding, seepage.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: seepage.
47B Monongahela	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
47C2 Monongahela	Severe: percs slowly, wetness.	Severe: slope, wetness.	Moderate: slope, wetness.	Moderate: slope, wetness.	Fair: small stones, wetness, slope.
48B Monongahela	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
48C Monongahela	Severe: percs slowly, wetness.	Severe: slope, wetness.	Moderate: slope, wetness.	Moderate: slope, wetness.	Fair: small stones, wetness, slope.
49C Myersville	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: small stones, slope.
49D, 49F Myersville	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 10.--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
50B*:					
Nixa	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Poor: small stones.
Frederick	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey.
Lodi	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
50C*:					
Nixa	Severe: percs slowly.	Severe: slope.	Moderate: too clayey, slope.	Moderate: slope.	Poor: small stones.
Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
Lodi	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
51*, 52*. Pits					
53*. Pits and dumps					
54A Purdy	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.
55C*: Rock outcrop.					
Carbo	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
56C*: Rock outcrop.					
Frederick	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
56D*: Rock outcrop.					
Frederick	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
57E*: Rock outcrop.					
Laidig	Severe: slope, percs slowly, wetness.	Severe: seepage, slope, wetness.	Severe: slope.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

TABLE 10.--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
58B2 Sequoia	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
58C2 Sequoia	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
59B2*: Sequoia	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Berks	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
59C2*: Sequoia	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Berks	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
59D2*: Sequoia	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: slope, depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Berks	Severe: depth to rock, slope.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, area reclaim.
60C*: Sequoia	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
Berks	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, area reclaim.
60D*: Sequoia	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, area reclaim.
Berks	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, area reclaim.
61B Shelocta Variant	Moderate: percs slowly, large stones.	Moderate: seepage, large stones, slope.	Moderate: large stones.	Slight	Poor: too clayey.

See footnote at end of table.

TABLE 10.--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
62C---------- Shelocta Variant	Moderate: large stones, percs slowly, slope.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: too clayey, large stones.
63B---------- Shenval	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
63C2---------- Shenval	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
63D2---------- Shenval	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
64C---------- Sherando	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage.	Poor: seepage, large stones.
64D---------- Sherando	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope, seepage.	Poor: seepage, large stones, slope.
65B2---------- Swimley	Moderate: depth to rock, percs slowly.	Moderate: slope.	Severe: depth to rock, too clayey.	Slight----------	Poor: too clayey, hard to pack.
65C2---------- Swimley	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
66D, 66E, 67F------- Sylco	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: slope, area reclaim, small stones.
68B---------- Timberville Variant	Severe: flooding.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack, small stones.
69A---------- Tioga	Severe: poor filter.	Severe: flooding, seepage, wetness.	Severe: seepage.	Severe: seepage.	Fair: wetness, small stones.
70A*. Typic Udorthents					
71B2---------- Unison	Moderate: percs slowly.	Severe: seepage.	Severe: too clayey, seepage.	Slight----------	Poor: too clayey, hard to pack.
71C2---------- Unison	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: too clayey, seepage.	Moderate: slope.	Poor: too clayey, hard to pack.
72B2---------- Unison	Moderate: percs slowly.	Severe: seepage.	Severe: too clayey, seepage.	Slight----------	Poor: too clayey, hard to pack.
72C2---------- Unison	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: too clayey, seepage.	Moderate: slope.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 10.--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
72D2---------- Unison	Severe: slope.	Severe: seepage, slope.	Severe: slope, too clayey, seepage.	Severe: slope.	Poor: slope, too clayey, hard to pack.
73*. Urban land					
74E2*, 74F2*: Weikert----------	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, area reclaim, seepage.
Berks----------	Severe: depth to rock, slope.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, area reclaim.
75E2*, 75F2*: Weikert----------	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, area reclaim, seepage.
Berks----------	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, area reclaim.
76A---------- Wheeling	Severe: poor filter.	Severe: flooding, seepage.	Severe: seepage.	Moderate: flooding.	Fair: thin layer.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1B---------- Allegheny	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
2B---------- Allegheny	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
3B*: Allegheny----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Monongahela----------	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
4A*. Aquic Udifluvents				
5C2*: Berks----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Weikert----------	Poor: area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: small stones, area reclaim.
5D2*: Berks----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Weikert----------	Poor: area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: slope, small stones, area reclaim.
6C2*: Berks----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Weikert----------	Poor: area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: area reclaim, small stones.
6D2*: Berks----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Weikert----------	Poor: area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: slope, small stones, area reclaim.
7A, 8B, 8C, 9C-------- Buchanan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
10A---------- Buckton	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
11B Burketown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
12B*, 12C*: Carbo	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, large stones.
Endcav	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Rock outcrop.				
13A Chavies	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
14B2, 14C2 Chilhowie	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
14D2 Chilhowie	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
15B2, 15C2 Chilhowie	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
15D2 Chilhowie	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
16E3 Chilhowie	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
17B2*, 17C2*: Chilhowie	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Edom	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
17D2*: Chilhowie	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Edom	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
18B Cotaco	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
19B---------- Cotaco	Fair: large stones, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
20B---------- Cotaco Variant	Poor: low strength, shrink-swell.	Improbable----------	Improbable----------	Fair: too clayey, large stones, small stones.
21B---------- Craigsville	Fair: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim.
22F---------- Drall	Poor: slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones, area reclaim, slope.
23B2, 23C2---------- Edom	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
23D2---------- Edom	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
24B2, 24C2, 25B2, 25C2---------- Endcav	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
26C2---------- Fauquier	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
26D2---------- Fauquier	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
27E---------- Fauquier	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
28A*. Fluvaquents				
29B2*, 29C2*: Frederick----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, thin layer.
Lodi----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
29D2*: Frederick----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, thin layer.
Lodi----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
29E2*:				
Frederick	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, thin layer.
Lodi	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
30C3*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, thin layer.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
30D3*:				
Frederick	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, thin layer.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
31B2*, 31C2*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
31D2*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
31E2*:				
Frederick	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Lodi	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
32C*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
32D*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
32E*:				
Frederick	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Lodi	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
33B2*, 33C2*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, thin layer.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
33D2*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, thin layer.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
33E2*:				
Frederick	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, thin layer.
Lodi	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
34C*:				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, thin layer.
Rock outcrop.				
34E*:				
Frederick	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, thin layer.
Rock outcrop.				
35B Guernsey	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey.
36B Hawksbill	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines.	Poor: area reclaim, small stones.
37B Hawksbill	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines.	Poor: large stones, area reclaim.
38C Hawksbill	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
39B, 39C, 40B, 40C---- Laidig	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
40D---------- Laidig	Fair: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
40E---------- Laidig	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
41C---------- Laidig	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
41D---------- Laidig	Fair: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
41E---------- Laidig	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
42C*:				
Laidig----------	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Buchanan----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
43C*:				
Lehew----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Dekalb----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Calvin----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
43D*:				
Lehew----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Calvin----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
44E*:				
Lehew----------	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Dekalb----------	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Calvin----------	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
44F*: Lehew	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Calvin	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
45A Massanetta	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
46A Millrock	Good	Probable	Probable	Poor: too sandy.
47B Monongahela	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
47C2 Monongahela	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones.
48B, 48C Monongahela	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
49C Myersville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: large stones, small stones, slope.
49D Myersville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
49F Myersville	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
50B*, 50C*: Nixa	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
51*, 52*. Pits				
53*. Pits and dumps				
54A Purdy	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
55C*: Rock outcrop.				

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
55C*:				
Carbo	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, large stones.
56C*:				
Rock outcrop.				
Frederick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, thin layer.
56D*:				
Rock outcrop.				
Frederick	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, thin layer.
57E*:				
Rock outcrop.				
Laidig	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
58B2, 58C2				
Sequoia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
59B2*, 59C2*:				
Sequoia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Berks	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
59D2*:				
Sequoia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Berks	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
60C*:				
Sequoia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Berks	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
60D*:				
Sequoia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
Berks	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
61B, 62C				
Shelocta Variant	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
63B, 63C2---------- Shenval	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
63D2---------- Shenval	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
64C---------- Sherando	Fair: large stones.	Probable----------	Probable----------	Poor: large stones, area reclaim.
64D---------- Sherando	Severe: slope.	Probable----------	Probable----------	Poor: large stones, area reclaim, slope.
65B2, 65C2---------- Swimley	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
66D---------- Sylco	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
66E, 67F---------- Sylco	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
68B---------- Timberville Variant	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
69A---------- Tioga	Good----------	Probable----------	Probable----------	Good.
70A*. Typic Udorthents				
71B2, 71C2---------- Unison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
72B2, 72C2---------- Unison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, thin layer.
72D2---------- Unison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, thin layer, slope.
73*. Urban land				
74E2*, 74F2*: Weikert----------	Poor: slope, area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: slope, small stones, area reclaim.
Berks----------	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
75E2*, 75F2*: Weikert----------	Poor: slope, area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: slope, small stones, area reclaim.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
75E2*, 75F2*: Berks	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
76A---------- Wheeling	Fair: low strength.	Probable----------	Probable----------	Fair: small stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
1B---------- Allegheny	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable------	Favorable.
2B---------- Allegheny	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Large stones---	Large stones, droughty.
3B*: Allegheny--------	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable------	Favorable.
Monongahela------	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
4A*. Aquic Udifluvents						
5C2*, 5D2*: Berks----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Depth to rock, slope, large stones.	Droughty, depth to rock, slope.
Weikert----------	Severe: depth to rock, slope, seepage.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty.
6C2*, 6D2*: Berks----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
Weikert----------	Severe: depth to rock, slope, seepage.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
7A---------- Buchanan	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly---	Large stones, wetness.	Large stones, wetness.
8B---------- Buchanan	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, slope.	Large stones, wetness.	Large stones, wetness.
8C, 9C---------- Buchanan	Severe: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, slope.	Slope, large stones, wetness.	Large stones, wetness, slope.
10A---------- Buckton	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
11B---------- Burketown	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Wetness, rooting depth.	Rooting depth.
12B*: Carbo----------	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Depth to rock, erodes easily, percs slowly.	Erodes easily, depth to rock, percs slowly.
Endcav----------	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
12B*: Rock outcrop.						
12C*: Carbo	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Endcav	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily, percs slowly.
Rock outcrop.						
13A Chavies	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable.
14B2 Chilhowie	Moderate: depth to rock, slope.	Severe: seepage, hard to pack.	Severe: no water.	Deep to water	Large stones, depth to rock.	Large stones, droughty.
14C2, 14D2 Chilhowie	Severe: slope.	Severe: seepage, hard to pack.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
15B2 Chilhowie	Moderate: depth to rock, slope.	Severe: seepage, hard to pack.	Severe: no water.	Deep to water	Large stones, depth to rock.	Large stones, droughty.
15C2, 15D2, 16E3 Chilhowie	Severe: slope.	Severe: seepage, hard to pack.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
17B2*: Chilhowie	Moderate: depth to rock, slope.	Severe: seepage, hard to pack.	Severe: no water.	Deep to water	Large stones, depth to rock, erodes easily.	Large stones, erodes easily, droughty.
Edom	Moderate: seepage, depth to rock, slope.	Moderate: hard to pack, thin layer.	Severe: no water.	Deep to water	Favorable	Favorable.
17C2*, 17D2*: Chilhowie	Severe: slope.	Severe: seepage, hard to pack.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, erodes easily.
Edom	Severe: slope.	Moderate: hard to pack, thin layer.	Severe: no water.	Deep to water	Slope	Slope.
18B Cotaco	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Slope	Erodes easily, wetness.	Erodes easily.
19B Cotaco	Moderate: seepage, slope.	Severe: piping, large stones, wetness.	Moderate: slow refill, large stones.	Large stones, slope.	Large stones, wetness.	Large stones, droughty.
20B Cotaco Variant	Moderate: slope.	Hard to pack, wetness.	Severe: no water.	Percs slowly, large stones, frost action.	Wetness, percs slowly.	Percs slowly.
21B Craigsville	Severe: seepage.	Severe: seepage, large stones.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
22F---------- Drall	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: no water.	Deep to water	Large stones, too sandy, slope.	Droughty, large stones, slope.
23B2---------- Edom	Moderate: seepage, depth to rock, slope.	Moderate: hard to pack, thin layer.	Severe: no water.	Deep to water	Favorable------	Favorable.
23C2, 23D2-------- Edom	Severe: slope.	Moderate: hard to pack, thin layer.	Severe: no water.	Deep to water	Slope----------	Slope.
24B2---------- Endcav	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily, percs slowly.
24C2---------- Endcav	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily, percs slowly.
25B2---------- Endcav	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily, percs slowly.
25C2---------- Endcav	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily, percs slowly.
26C2, 26D2, 27E--- Fauquier	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.
28A*. Fluvaquents						
29B2*: Frederick--------	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Favorable------	Favorable.
Lodi----------	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
29C2* 29D2* 29E2* 30C3* 30D3*: Frederick-------	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.
Lodi----------	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
31B2*: Frederick--------	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Favorable------	Favorable.
Lodi----------	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
31C2* 31D2*, 31E2*, 32C*, 32D*, 32E*: Frederick-------	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.
Lodi----------	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
33B2*:						
Frederick	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Favorable	Favorable.
Lodi	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
33C2*, 33D2*, 33E2*:						
Frederick	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope.
Lodi	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
34C*, 34E*:						
Frederick	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope.
Rock outcrop.						
35B--- Guernsey	Moderate: seepage, depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, percs slowly.
36B, 37B--- Hawksbill	Severe: seepage.	Severe: large stones.	Severe: no water.	Deep to water.	Large stones	Large stones.
38C--- Hawksbill	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water.	Large stones, slope.	Large stones, slope.
39B--- Laidig	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Rooting depth	Rooting depth.
39C--- Laidig	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth.	Slope, rooting depth.
40B--- Laidig	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Large stones, rooting depth.	Large stones, rooting depth.
40C, 40D, 40E--- Laidig	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, rooting depth.	Slope, large stones, rooting depth.
41C, 41D, 41E--- Laidig	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, rooting depth.	Slope, large stones, droughty.
42C*:						
Laidig	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, rooting depth.	Large stones, slope, droughty.
Buchanan	Severe: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, slope.	Slope, large stones, wetness.	Large stones, wetness, slope.
43C*, 43D*:						
Lehew	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
43C*, 43D*: Dekalb	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
Calvin	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
44E*: Lehew	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Calvin	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
44F*: Lehew	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Calvin	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
45A Massanetta	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Flooding	Erodes easily, wetness.	Erodes easily.
46A Millrock	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy	Droughty.
47B Monongahela	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
47C2 Monongahela	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
48B Monongahela	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
48C Monongahela	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
49C, 49D, 49F Myersville	Severe: slope.	Moderate: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones.	Large stones, slope.
50B*: Nixa	Slight	Moderate: seepage, piping.	Severe: no water.	Deep to water	Large stones, erodes easily, rooting depth.	Erodes easily, droughty, rooting depth.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
50B*:						
Frederick	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Favorable	Favorable.
Lodi	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
50C*:						
Nixa	Slight	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope, erodes easily, rooting depth.	Slope, erodes easily, droughty.
Frederick	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope.
Lodi	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
51*, 52*. Pits						
53*. Pits and dumps						
54A Purdy	Slight	Severe: piping, hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
55C*:						
Rock outcrop.						
Carbo	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
56C*, 56D*:						
Rock outcrop.						
Frederick	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope.
57E*:						
Rock outcrop.						
Laidig	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, rooting depth.	Large stones, slope, droughty.
58B2 Sequoia	Moderate: depth to rock.	Severe: hard to pack.	Severe: no water.	Deep to water	Depth to rock, erodes easily.	Erodes easily, depth to rock.
58C2 Sequoia	Moderate: depth to rock.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
59B2*:						
Sequoia	Moderate: depth to rock.	Severe: hard to pack.	Severe: no water.	Deep to water	Depth to rock, erodes easily.	Erodes easily, depth to rock.
Berks	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Depth to rock, large stones.	Droughty, depth to rock, large stones.
59C2*:						
Sequoia	Moderate: depth to rock.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
59C2*:						
Berks	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Depth to rock, slope, large stones.	Droughty, depth to rock, slope.
59D2*:						
Sequoia	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Berks	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Depth to rock, slope, large stones.	Droughty, depth to rock, slope.
60C*, 60D*:						
Sequoia	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Depth to rock, erodes easily, slope.
Berks	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
61B---------- Shelocta Variant	Moderate: seepage, slope.	Moderate: hard to pack, large stones.	Severe: no water.	Deep to water	Large stones, slope.	Large stones, slope.
62C---------- Shelocta Variant	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, slope.	Large stones, slope.
63B---------- Shenval	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Favorable------	Favorable.
63C2, 63D2-------- Shenval	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.
64C, 64D---------- Sherando	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: no water.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
65B2---------- Swimley	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
65C2---------- Swimley	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
66D, 66E, 67F----- Sylco	Severe: slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
68B---------- Timberville Variant	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Favorable------	Favorable.
69A---------- Tioga	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Erodes easily	Erodes easily.
70A*. Typic Udorthents						
71B2---------- Unison	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Favorable------	Favorable.
71C2---------- Unison	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
72B2---------- Unison	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Large stones---	Large stones.
72C2, 72D2-------- Unison	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Large stones, slope.	Large stones, slope.
73*. Urban land						
74E2*, 74F2*: Weikert----------	Severe: depth to rock, slope, seepage.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty.
Berks----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Depth to rock, slope, large stones.	Droughty, depth to rock, slope.
75E2*, 75F2*: Weikert----------	Severe: depth to rock, slope, seepage.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Berks----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
76A---------- Wheeling	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable------	Favorable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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 > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1B---------- Allegheny	0-9	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	90-100	80-100	60-85	35-55	<20	NP-5
	9-32	Clay loam, loam, sandy clay loam.	ML, CL, SM, SC	A-4, A-6	0	90-100	80-100	65-95	35-80	<35	NP-15
	32-54	Clay loam, sandy loam, gravelly sandy loam.	SM, GC, ML, CL	A-4, A-6, A-2, A-1	0-5	65-100	55-100	35-95	20-75	<35	NP-15
	54-60	Stratified sand, gravel, cobbles.	SP, GP, SP-SM	A-1, A-2	0-15	30-70	20-55	5-20	2-10	---	NP
2B---------- Allegheny	0-9	Cobbly fine sandy loam.	ML, SM, CL, SC	A-2, A-4	15-30	80-95	70-85	50-80	25-60	<30	NP-10
	9-32	Clay loam, silty clay loam, gravelly sandy clay loam.	SM, CL, ML, SC	A-2, A-4, A-6	0-15	70-95	60-90	50-90	20-85	16-35	2-15
	32-54	Clay loam, very gravelly sandy loam, loam.	ML, CL, SM, GM	A-4, A-6, A-2, A-1	0-15	40-95	30-95	25-95	20-75	10-35	NP-15
	54-60	Stratified sand, gravel, cobbles.	SP, GP, SP-SM	A-1, A-2	0-15	30-70	20-55	5-20	2-10	---	NP
3B*: Allegheny-------	0-9	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	90-100	80-100	60-85	35-55	<20	NP-5
	9-32	Clay loam, loam, sandy clay loam.	ML, CL, SM, SC	A-4, A-6	0	90-100	80-100	65-95	35-80	<35	NP-15
	32-54	Clay loam, sandy loam, gravelly sandy loam.	SM, GC, ML, CL	A-4, A-6, A-2, A-1	0-5	65-100	55-100	35-95	20-75	<35	NP-15
	54-60	Stratified sand, gravel, cobbles.	SP, GP, SP-SM	A-1, A-2	0-15	30-70	20-55	5-20	2-10	---	NP
Monongahela-----	0-10	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-4	0-5	90-100	85-100	75-100	45-90	20-35	1-10
	10-24	Silt loam, clay loam, gravelly loam.	ML, CL, CL-ML	A-4, A-6	0-15	90-100	80-100	75-100	70-90	20-40	5-15
	24-33	Silt loam, sandy clay loam, gravelly loam.	ML, CL, SM, SC	A-4, A-6	0-10	80-100	60-100	55-95	45-95	20-40	3-15
	33-60	Loam, clay loam, clay.	CH	A-7	0-5	90-100	70-90	60-85	50-85	50-75	20-40
4A*. Aquic Udifluvents											
5C2*, 5D2*: Berks-----------	0-6	Shaly silt loam	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	6-15	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
	15-31	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
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
5C2*, 5D2*:											
Weikert	0-7	Shaly 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
	7-14	Very shaly silt loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	14	Weathered bedrock.	---	---	---	---	---	---	---	---	---
6C2*, 6D2*:											
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
	6-15	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
	15-31	Shaly loam, very shaly loam, very shaly silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
Weikert	0-7	Very stony silt loam.	GM, ML, SM	A-1, A-2, A-4	3-15	35-70	35-70	25-65	20-55	*30-40	4-10
	7-14	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
	14	Weathered bedrock	---	---	---	---	---	---	---	---	---
7A Buchanan	0-7	Silt loam	ML, CL, CL-ML	A-4	0-5	90-100	85-100	75-90	65-85	20-35	2-11
	7-21	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-4, A-2	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	21-60	Gravelly loam, silt loam, channery clay loam.	GM, ML, CL, SM	A-4, A-2, A-6	0-20	50-100	30-80	30-75	20-60	20-35	2-15
8B, 8C Buchanan	0-7	Cobbly fine sandy loam.	GM, ML, CL	A-4, A-2	10-20	50-100	45-75	40-75	30-65	20-35	2-11
	7-21	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-4, A-2	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	21-60	Gravelly loam, silt loam, channery clay loam.	GM, ML, CL, SM	A-4, A-2, A-6	0-20	50-100	30-80	30-75	20-60	20-35	2-15
9C Buchanan	0-7	Very stony fine sandy loam.	GM, ML, CL	A-2, A-4	3-20	50-90	45-75	40-75	30-65	20-35	2-11
	7-21	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-2, A-4	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	21-60	Gravelly loam, loam, channery clay loam.	GM, ML, CL, SM	A-2, A-4, A-6	0-20	50-100	30-80	30-75	20-60	20-35	2-15
10A Buckton	0-8	Loam	CL, ML, SM-SC, CL-ML	A-4, A-6	0-2	99-100	98-100	80-100	50-90	<30	NP-15
	8-53	Silt loam, silty clay loam, clay loam.	CL, SC	A-4, A-6, A-7	0-2	99-100	98-100	90-95	70-90	20-45	7-25
	53-80	Stratified fine sand to gravelly sandy loam.	SM, SM-SC, CL-ML	A-1, A-2, A-4	0-25	75-90	70-90	45-65	15-40	<20	NP-7

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
11B---------- Burketown	0-11	Fine sandy loam	ML, SM, SC, CL	A-2, A-4	0	95-100	85-100	55-95	30-65	<25	NP-8
	11-24	Fine sandy loam, loam.	ML, SM, SC, CL	A-2, A-4	0	95-100	85-100	55-95	30-75	<30	NP-10
	24-44	Fine sandy loam	ML, SM, SC, CL	A-2, A-4	0	95-100	85-100	60-85	30-55	<25	NP-8
	44-60	Sandy loam, sandy clay loam, clay.	SM, ML, CL, CH	A-2, A-4, A-6, A-7	0	95-100	85-100	60-95	30-85	<65	NP-35
12B*, 12C*:											
Carbo----------	0-10	Silt loam--------	CL, ML	A-6, A-7	0-2	95-100	90-100	85-95	75-85	30-50	10-15
	10-32	Clay------------	CH	A-7	0-5	95-100	85-100	80-95	70-90	60-80	35-55
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Endcav----------	0-7	Silt loam--------	CL-ML, CL	A-4, A-6	0	90-100	90-100	80-100	65-90	20-35	5-15
	7-57	Clay------------	CH	A-7	0	80-100	75-100	70-100	60-95	60-85	35-55
	57	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
13A---------- Chavies	0-11	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	85-100	75-100	40-90	40-75	<25	NP-5
	11-42	Fine sandy loam, silt loam, loam.	SM, ML	A-4	0	85-100	75-100	65-100	45-85	<35	NP-8
	42-72	Fine sandy loam, gravelly fine sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4, A-2, A-1-b	0-5	70-100	60-95	40-85	20-75	<25	NP-5
14B2, 14C2, 14D2, 15B2, 15C2, 15D2---------- Chilhowie	0-5	Silty clay-------	CL, CH	A-7	0-10	90-100	85-100	80-100	70-95	40-60	20-40
	5-13	Clay, silty clay	CH	A-7	0-10	90-100	85-100	80-100	75-95	50-65	30-45
	13-25	Very channery clay, very channery silty clay, flaggy clay.	CH, GC, MH, GM	A-7, A-2	10-30	25-80	15-65	15-65	15-60	50-65	20-35
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
16E3---------- Chilhowie	0-5	Clay------------	CL, CH	A-7	0-10	90-100	85-100	80-100	70-95	40-60	20-40
	5-13	Clay, silty clay	CH	A-7	0-10	90-100	85-100	80-100	75-95	50-65	30-45
	13-25	Very channery clay, very channery silty clay, flaggy clay.	CH, GC, MH, GM	A-7, A-2	10-30	25-80	15-65	15-65	15-60	50-65	20-35
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
17B2*, 17C2* 17D2*: Chilhowie------	0-5	Silty clay loam	CL	A-6, A-7	0-10	90-100	85-100	80-100	75-95	30-50	10-25
	5-13	Clay, silty clay	CH	A-7	0-10	90-100	85-100	80-100	75-95	50-65	30-45
	13-25	Very channery clay, very channery silty clay, flaggy clay.	CH, GC, MH, GM	A-7, A-2	10-30	25-80	15-65	15-65	15-60	50-65	20-35
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
17B2*, 17C2*, 17D2*:											
Edom	0-6	Silty clay loam	ML, CL	A-4, A-6	0	85-100	80-100	75-95	70-90	---	---
	6-34	Silty clay, channery clay, shaly silty clay loam.	CH, CL	A-7, A-6	0-10	70-90	65-85	65-85	55-80	35-55	12-30
	34-60	Shaly silty clay loam, channery silty clay, shaly clay.	CL, CL-ML	A-7, A-6	5-20	70-90	70-85	60-80	50-75	35-49	10-20
18B---------- Cotaco	0-15	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0-5	80-100	75-95	55-85	35-80	<30	NP-7
	15-60	Gravelly sandy clay loam, clay loam, loam.	SC, SM, GC, CL	A-2, A-4, A-6, A-1-b	0-10	60-100	50-95	40-70	20-70	<35	NP-15
19B---------- Cotaco	0-15	Cobbly fine sandy loam.	CL, SM, ML, SC	A-4	25-40	80-95	70-90	60-90	45-80	<30	NP-10
	15-60	Gravelly sandy clay loam, cobbly loam, clay loam.	GM, SC, ML, CL	A-4, A-6	0-40	65-95	50-95	45-90	36-75	12-35	NP-15
20B---------- Cotaco Variant	0-5	Cobbly loam------	SM, ML, CL-ML, CL	A-4	20-45	75-95	55-90	50-85	40-65	20-30	NP-10
	5-36	Silt loam, loam, clay loam.	CL	A-6, A-7	<10	80-100	75-100	65-95	50-90	30-45	15-25
	36-60	Clay, silty clay	MH, CH	A-7	<10	80-100	75-100	70-100	60-95	50-80	25-55
21B---------- Craigsville	0-8	Cobbly fine sandy loam.	ML, SM, CL-ML	A-2, A-4	10-25	80-95	75-95	45-90	30-60	<25	NP-10
	8-22	Gravelly sandy loam, cobbly loam, very gravelly sandy loam.	SM, GM, GC, SC	A-1, A-2, A-4	25-60	50-80	30-65	25-60	15-40	<25	NP-10
	22-60	Very gravelly loamy sand, very gravelly sandy loam, very cobbly sandy loam.	GC, GM, GP-GM, GM-GC	A-1, A-2	35-75	35-55	30-50	20-45	10-25	<25	NP-8
22F---------- Drall	0-6	Extremely stony sandy loam.	SW-SM, SM	A-1, A-2-4	25-65	60-75	30-60	20-45	10-20	10-15	<10
	6-60	Very stony sand, very channery loamy sand.	SW, SM, GW, GM	A-1, A-2-4	30-65	30-60	15-45	10-30	4-15	10-15	<10
23B2, 23C2, 23D2- Edom	0-6	Silty clay loam	ML, CL	A-4, A-6	0	85-100	80-100	75-95	70-90	---	---
	6-34	Silty clay, channery clay, shaly silty clay loam.	CH, CL	A-7, A-6	0-10	70-90	65-85	65-85	55-80	35-55	12-30
	34-70	Shaly silty clay loam, channery silty clay, shaly clay.	CL, CL-ML	A-7, A-6	5-20	70-90	70-85	60-80	50-75	35-49	10-20
24B2, 24C2, 25B2, 25C2---------- Endcav	0-7	Silt loam--------	CL-ML, CL	A-4, A-6	0	90-100	90-100	80-100	65-90	20-35	5-15
	7-57	Clay------------	CH	A-7	0	80-100	75-100	70-100	60-95	60-85	35-55
	57	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
26C2, 26D2------- Fauquier	0-7	Stony silt loam	CL, CL-ML	A-4, A-6	2-5	80-100	75-100	65-95	50-95	22-34	4-14
	7-45	Silty clay loam, clay, gravelly silty clay.	CL, CH, MH, SC	A-6, A-7	0-5	80-100	70-100	50-95	45-95	36-70	16-36
	45	Weathered bedrock	---	---	---	---	---	---	---	---	---
27E---------- Fauquier	0-7	Very stony silt loam.	SM-SC, CL, CL-ML, GC	A-4, A-6	5-25	60-80	55-70	50-60	45-60	22-34	4-14
	7-45	Silty clay loam, clay, gravelly silty clay.	CL, CH, MH, SC	A-6, A-7	0-5	80-100	70-100	50-95	45-95	36-70	16-36
	45	Weathered bedrock	---	---	---	---	---	---	---	---	---
28A*. Fluvaquents											
29B2*, 29C2*, 29D2*, 29E2*: Frederick------	0-9	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	75-95	75-90	<35	NP-15
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	CL, CL-ML	A-6, A-7	0-5	80-100	60-100	55-100	50-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, clay loam, silty clay.	CH, MH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	30-55
	59-72	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	75-100	65-95	60-85	25-55
Lodi----------	0-7	Silt loam--------	ML, CL, SM, SC	A-2, A-4, A-6	0-5	80-100	75-95	50-90	25-85	<30	NP-15
	7-11	Loam, silt loam, clay loam.	CL	A-6	0-10	85-100	75-95	65-90	55-85	25-40	10-20
	11-72	Clay, silty clay loam, sandy clay loam.	CH, MH, CL, SC	A-7, A-6	0-5	85-100	75-95	60-95	40-80	40-60	20-35
30C3*, 30D3*: Frederick-------	0-9	Silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0-5	80-100	75-100	70-95	50-95	20-45	5-25
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	CL, CL-ML	A-6, A-7	0-5	80-100	60-100	55-100	50-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, clay loam, silty clay.	CH, MH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	30-55
	59-72	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	75-100	65-95	60-85	25-55
Lodi----------	0-7	Silty clay loam	CL, CH	A-6, A-7	0-10	85-100	75-95	70-95	70-85	40-60	20-35
	7-11	Loam, silt loam, clay loam.	CL	A-6	0-10	85-100	75-95	65-90	55-85	25-40	10-20
	11-72	Clay, silty clay loam, sandy clay loam.	CH, MH, CL, SC	A-7, A-6	0-5	85-100	75-95	60-95	40-80	40-60	20-35
31B2*, 31C2*, 31D2*, 31E2*: Frederick------	0-9	Cherty silt loam	GM, GC, ML	A-4, A-6	0-10	50-80	45-75	40-75	35-70	<35	NP-15
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	ML, CL, GC	A-6, A-7	0-5	70-100	60-100	55-100	45-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	25-55

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
31B2*, 31C2*, 31D2*, 31E2*:											
Lodi	0-7	Cherty silt loam	GM, GC, SM, SC	A-2, A-4, A-6	15-25	50-85	40-75	30-60	15-50	<30	NP-15
	7-11	Loam, silt loam, clay loam.	CL	A-6	0-10	85-100	75-95	65-90	55-85	25-40	10-20
	11-72	Clay, silty clay loam, sandy clay loam.	CH, MH, CL, SC	A-7, A-6	0-5	85-100	75-95	60-95	40-80	40-60	20-35
32C*, 32D*, 32E*:											
Frederick	0-9	Very cherty silt loam.	GM, GC	A-2, A-4, A-1	0-15	40-60	25-35	20-35	15-25	20-45	5-25
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	ML, CL, GC	A-6, A-7	0-5	70-100	60-100	55-100	45-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	25-55
Lodi	0-7	Very cherty silt loam.	GM, GC, SM, SC	A-2, A-4, A-6	15-25	50-85	40-75	30-60	15-50	<30	NP-15
	7-11	Loam, silt loam, clay loam.	CL	A-6	0-10	85-100	75-95	65-90	55-85	25-40	10-20
	11-72	Clay, silty clay loam, sandy clay loam.	CH, MH, CL, SC	A-7, A-6	0-5	85-100	75-95	60-95	40-80	40-60	20-35
33B2*, 33C2*, 33D2*, 33E2*:											
Frederick	0-9	Silt loam	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	75-95	75-90	<35	NP-15
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	CL, CL-ML	A-6, A-7	0-5	80-100	60-100	55-100	50-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, clay loam, silty clay.	CH, MH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	30-55
	59-72	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	75-100	65-95	60-85	25-55
Lodi	0-7	Silt loam	ML, CL, SM, SC	A-2, A-4, A-6	0-5	80-100	75-95	50-90	25-85	<30	NP-15
	7-11	Loam, silt loam, clay loam.	CL	A-6	0-10	85-100	75-95	65-90	55-85	25-40	10-20
	11-72	Clay, silty clay loam, sandy clay loam.	CH, MH, CL, SC	A-7, A-6	0-5	85-100	75-95	60-95	40-80	40-60	20-35
34C*, 34E*:											
Frederick	0-9	Silt loam	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	75-95	75-90	<35	NP-15
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	CL, CL-ML	A-6, A-7	0-5	80-100	60-100	55-100	50-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, clay loam, silty clay.	CH, MH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	30-55
	59-72	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	75-100	65-95	60-85	25-55
Rock outcrop.											

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
35B---------- Guernsey	0-10	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0-2	90-100	80-100	75-95	70-90	25-40	4-14
	10-19	Silt loam, silty clay loam.	CL, CH, ML, MH	A-6, A-7	0-2	80-100	70-100	65-100	60-95	35-54	11-26
	19-60	Silty clay, clay, clay loam.	CH, CL, ML, MH	A-7	0-10	75-100	65-100	60-100	55-95	45-65	18-35
36B---------- Hawksbill	0-9	Cobbly loam------	SM, GM, SW-SM, GW-GM	A-1, A-2, A-4	20-70	40-75	20-70	15-65	10-50	<25	5-15
	9-26	Cobbly loam, very cobbly clay loam, gravelly clay loam.	GC, CL	A-2, A-6	20-70	40-75	35-70	25-60	20-55	25-40	10-20
	26-36	Very gravelly clay loam, very cobbly loam, very cobbly clay loam.	GC	A-2, A-6	50-75	30-65	20-60	20-60	15-45	25-40	10-20
	36-60	Very gravelly loam, very cobbly loam.	GM, GC	A-1, A-2, A-4, A-6	50-75	30-65	20-60	20-60	15-45	<30	NP-15
37B---------- Hawksbill	0-9	Very cobbly loam	SM, GM, SW-SM, GW-GM	A-1, A-2, A-4	20-70	40-75	20-70	15-65	10-50	<25	5-15
	9-26	Cobbly loam, very cobbly clay loam, gravelly clay loam.	GC, CL	A-2, A-6	20-70	40-75	35-70	25-60	20-55	25-40	10-20
	26-36	Very gravelly clay loam, very cobbly loam, very cobbly clay loam.	GC	A-2, A-6	50-75	30-65	20-60	20-60	15-45	25-40	10-20
	36-60	Very gravelly loam, very cobbly loam.	GM, GC	A-1, A-2, A-4, A-6	50-75	30-65	20-60	20-60	15-45	<30	NP-15
38C---------- Hawksbill	0-9	Extremely stony loam.	SM, GM, SW-SM, GW-GM	A-1, A-2, A-4	60-85	65-75	20-70	15-65	10-50	<25	5-15
	9-26	Cobbly loam, very cobbly clay loam, gravelly clay loam.	GC, CL	A-2, A-6	20-70	40-75	35-70	25-60	20-55	25-40	10-20
	26-36	Very gravelly clay loam, very cobbly loam, very cobbly clay loam.	GC	A-2, A-6	50-75	30-65	20-60	20-60	15-45	25-40	10-20
	36-60	Very gravelly loam, very cobbly loam.	GM, GC	A-1, A-2, A-4, A-6	50-75	30-65	20-60	20-60	15-45	<30	NP-15
39B, 39C---------- Laidig	0-6	Gravelly fine sandy loam.	SM, GM, GM-GC, SM-SC	A-1, A-2, A-4	0-5	65-90	55-80	35-70	15-45	15-25	NP-5
	6-41	Cobbly clay loam, cobbly sandy clay loam, cobbly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	5-30	70-95	55-90	40-80	20-70	15-40	2-18
	41-60	Cobbly sandy clay loam, channery loam, cobbly sandy loam.	GC, SC, GM-GC, CL-ML	A-2, A-4, A-6	5-30	50-90	40-85	30-80	15-70	15-35	2-16

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
40B, 40C, 40D, 40E---------- Laidig	0-6	Cobbly fine sandy loam.	SM, ML, CL, SM-SC	A-2, A-4	10-25	80-95	75-90	45-90	25-70	15-30	NP-10
	6-41	Cobbly loam, cobbly sandy clay loam, cobbly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	15-30	70-95	55-90	40-80	20-70	15-40	2-18
	41-60	Cobbly sandy clay loam, channery loam, cobbly sandy loam.	GC, SC, GM-GC, CL-ML	A-2, A-4, A-6	15-30	50-90	40-85	30-80	15-70	15-35	2-16
41C, 41D, 41E---- Laidig	0-6	Very stony fine sandy loam.	GM-GC, SM, CL-ML, SM-SC	A-4	3-15	65-90	50-80	45-80	35-70	15-30	NP-10
	6-41	Cobbly loam, channery sandy clay loam, cobbly sandy loam.	SM, SC, ML, CL	A-2, A-4, A-6	15-30	70-95	55-90	40-80	20-70	15-40	2-18
	41-60	Cobbly sandy clay loam, channery loam, cobbly sandy loam.	SC, GM-GC, CL-ML, GC	A-2, A-4, A-6	15-30	50-90	40-85	30-80	15-70	15-35	2-16
42C*: Laidig----------	0-6	Extremely stony loam.	GM-GC, CL-ML, SM-SC, SM	A-4	15-30	65-90	50-80	45-80	35-70	15-30	NP-10
	6-41	Cobbly loam, channery sandy clay loam, cobbly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	15-30	70-95	55-90	40-80	20-70	15-40	2-18
	41-60	Cobbly sandy clay loam, channery loam, cobbly sandy loam.	GC, GM-GC, CL-ML, SC	A-2, A-4, A-6	15-30	50-90	40-85	30-80	15-70	15-35	2-16
Buchanan--------	0-7	Extremely stony loam.	GM, ML, CL, CL-ML	A-2, A-4	5-20	50-85	45-70	40-70	30-60	20-35	2-11
	7-21	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-2, A-4	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	21-60	Gravelly loam, loam, channery clay loam.	GM, ML, CL, SM	A-2, A-4, A-6	0-20	50-100	30-80	30-75	20-60	20-35	2-15
43C*: Lehew----------	0-15	Cobbly sandy loam.	GM, ML, CL-ML, SM	A-2, A-4	5-30	50-80	45-70	40-65	25-60	15-30	NP-7
	15-29	Very channery loam, channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	5-40	45-75	30-65	20-55	10-40	15-30	NP-7
	29	Very channery sandy loam, very channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	10-50	45-75	30-65	20-55	10-40	15-30	NP-7
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
43C*:											
Dekalb	0-6	Cobbly sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	0-30	50-90	45-80	40-75	20-55	15-32	NP-9
	6-34	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Calvin	0-7	Cobbly shaly loam	ML, CL	A-4	15-20	70-95	70-90	65-90	55-75	20-40	NP-10
	7-21	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
	21-26	Shaly silt loam, very shaly silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-13
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
43D*:											
Lehew	0-15	Cobbly sandy loam.	GM, ML, CL-ML, SM	A-2, A-4	5-30	50-80	45-70	40-65	25-60	15-30	NP-7
	15-29	Very channery loam, channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	5-40	45-75	30-65	20-55	10-40	15-30	NP-7
	29	Very channery sandy loam, very channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	10-50	45-75	30-65	20-55	10-40	15-30	NP-7
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---
Dekalb	0-6	Cobbly sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	0-30	50-90	45-80	40-75	20-55	15-32	NP-9
	6-34	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Calvin	0-7	Cobbly silt loam.	ML, CL	A-4	0-15	70-95	70-90	65-90	55-75	20-40	NP-10
	7-21	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
	21-26	Shaly silt loam, very shaly silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-13
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
44E*:											
Lehew	0-15	Very stony sandy loam.	SM, GM, ML, CL-ML	A-2, A-4	5-25	50-90	45-80	40-75	20-55	15-30	NP-7
	15-29	Very channery sandy loam, channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	5-40	45-75	30-65	20-55	10-40	15-30	NP-7
	29	Very channery sandy loam, very channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	10-50	45-75	30-65	20-55	10-40	15-30	NP-7
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---
Dekalb	0-6	Very stony loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	15-32	NP-9
	6-34	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Calvin	0-7	Very stony loam	ML, CL	A-4	3-15	70-100	70-100	65-95	55-90	20-40	NP-10
	7-21	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
	21-26	Shaly silt loam, very shaly silt loam, very channery loam.	GM, SM, GM-GC, SM-SC	A-2, A-1, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-11
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
44F*:											
Lehew	0-15	Very stony sandy loam.	ML, CL-ML, SM	A-2, A-4	5-25	50-90	45-80	40-75	20-55	15-30	NP-7
	15-29	Very channery sandy loam, channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	5-40	45-75	30-65	20-55	10-40	15-30	NP-7
	29	Very channery sandy loam, very channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	10-50	45-75	30-65	20-55	10-40	15-30	NP-7
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---
Dekalb	0-6	Very stony loam	SM, GM ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	15-32	NP-9
	6-34	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	34	Unweathered	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
44F*:											
Calvin----------	0-7	Very stony loam	ML, CL, ML, SM, GM	A-4	3-15	70-100	70-100	65-95	55-90	20-40	NP-10
	7-21	Shaly silt loam, channery loam, very shaly clay loam.		A-2, A-4 A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	21-26	Shaly silt loam, very shaly silt loam, very channery loam.	GM, SM, GM-GC, SM-SC	A-2, A-1, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-11
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
45A---------- Massanetta	0-11	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-5	90-100	85-100	75-95	55-80	12-30	2-12
	11-25	Clay loam, silty clay loam, silt loam.	CL	A-6	0-5	90-100	85-100	75-95	55-85	25-40	10-20
	25-64	Loam, silty clay loam, gravelly clay loam.	CL, CL-ML, SM-SC, SC	A-4, A-6	0-10	75-100	60-100	50-95	40-90	20-40	5-20
	64-80	Variable---------	---	---	---	---	---	---	---	---	---
46A---------- Millrock	0-6	Loamy sand-------	SM	A-2, A-4, A-1	0	95-100	85-100	45-85	15-40	<20	NP
	6-40	Loamy sand, loamy fine sand, gravelly loamy sand.	SP-SM, SM	A-1, A-2, A-4	0	85-100	70-100	40-85	10-40	<20	NP
	40-60	Loamy sand, sand, gravelly loamy sand.	SP, SM, GP, GM	A-1, A-2, A-3	0-20	50-100	40-100	20-75	3-20	<20	NP
47B, 47C2-------- Monongahela	0-10	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-4	0-5	90-100	85-100	75-100	45-90	20-35	1-10
	10-24	Silt loam, clay loam, gravelly loam.	ML, CL, CL-ML	A-4, A-6	0-15	90-100	80-100	75-100	70-90	20-40	5-15
	24-33	Silt loam, sandy clay loam, gravelly loam.	ML, CL, SM, SC	A-4, A-6	0-10	80-100	60-100	55-95	45-95	20-40	3-15
	33-60	Loam, clay loam, clay.	CH	A-7, A-6	0-5	90-100	70-90	60-85	50-85	50-75	20-40
48B, 48C---------- Monongahela	0-10	Cobbly fine sandy loam.	ML, SM, CL-ML, SM-SC	A-4	10-20	85-95	80-90	70-80	45-75	20-35	1-10
	10-24	Silt loam, clay loam, gravelly loam.	ML, CL, CL-ML	A-4, A-6	0-15	90-100	80-100	75-100	70-90	20-40	5-15
	24-33	Silt loam, sandy clay loam, gravelly loam.	ML, CL, SM, SC	A-4, A-6	0-10	80-100	60-100	55-95	45-95	20-40	3-15
	33-60	Loam, clay loam, clay.	CH	A-7, A-6	0-5	90-100	70-90	60-85	50-85	50-75	20-40
49C---------- Myersville	0-5	Very stony silt loam.	ML, CL, CL-ML	A-4	5-25	95-100	90-100	80-95	55-85	18-28	2-10
	5-30	Silty clay loam, clay loam, cobbly clay loam.	CL	A-6	3-20	75-95	70-95	55-90	50-85	28-38	12-20
	30-44	Silty clay loam, cobbly silt loam, very cobbly clay loam	CL, CL-ML, GM	A-3, A-4	3-20	30-85	20-75	12-70	10-65	<28	NP-10
	44	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
49D, 49F--------- Myersville	0-5	Very stony silt loam.	ML, CL, CL-ML	A-4	5-25	95-100	90-100	80-95	55-85	18-28	2-10
	5-30	Silty clay loam, clay loam, cobbly clay loam	CL	A-6	3-20	75-95	70-95	55-90	50-85	28-38	12-20
	30-44	Silty clay loam, cobbly clay loam very cobbly clay loam.	CL, CL-ML, GM	A-3, A-4	3-20	30-85	20-75	12-70	10-65	<28	NP-10
	44	Weathered bedrock	---	---	---	---	---	---	---	---	---
50B*, 50C*: Nixa-----------	0-16	Cherty silt loam	GM, SM, GC, SC	A-1, A-2, A-4	0-10	40-70	30-60	25-55	20-50	<25	NP-8
	16-39	Very cherty silt loam, very cherty silty clay loam.	GC, GM, SC, SM	A-1, A-2, A-4	0-10	40-70	30-60	25-55	20-50	<30	NP-8
	39-60	Very cherty silty clay, very cherty silty clay loam.	GM, GC, GP-GM, GM-GC	A-1, A-2	10-30	15-45	5-40	5-35	5-30	<30	NP-8
Frederick-------	0-9	Cherty silt loam	GM, GC, ML	A-4, A-6	0-10	50-80	45-75	40-75	35-70	<35	NP-15
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	ML, CL, GC	A-6, A-7	0-5	70-100	60-100	55-100	45-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	25-55
Lodi-----------	0-7	Cherty silt loam	GM, GC, SM, SC	A-2, A-4, A-6	15-25	50-85	40-75	30-60	15-50	<30	NP-15
	7-11	Loam, silt loam, clay loam.	CL	A-6	0-10	85-100	75-95	65-90	55-85	25-40	10-20
	11-72	Clay, silty clay loam, sandy clay loam.	CH, MH, CL, SC	A-7, A-6	0-5	85-100	75-95	60-95	40-80	40-60	20-35
51*, 52*. Pits											
53*. Pits and dumps											
54A----------	0-7	Silt loam--------	ML, CL	A-4, A-6, A-7	0	95-100	90-100	90-100	90-100	25-50	4-20
Purdy	7-36	Silty clay, clay, clay loam.	CL, CH, MH	A-6, A-7	0	95-100	90-100	85-100	75-85	30-65	11-30
	36-60	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
55C*: Rock outcrop.											
Carbo----------	0-10	Silt loam--------	CL	A-6, A-7	0-2	95-100	90-100	85-95	75-85	30-50	10-15
	10-32	Clay----------	CH	A-7	0-5	95-100	85-100	80-95	70-90	60-80	35-55
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
56C*, 56D*: Rock outcrop.											

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
56C*, 56D*:											
Frederick-------	0-9	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	75-95	75-90	<35	NP-15
	9-13	Silt loam, silty clay loam, cherty silty clay loam.	CL, CL-ML	A-6, A-7	0-5	80-100	60-100	55-100	50-95	20-45	5-25
	13-39	Silty clay, clay, cherty clay.	CH, MH-CH	A-7	0-5	80-100	65-100	65-100	65-100	50-70	25-40
	39-59	Clay, clay loam, silty clay.	CH, ML-CH	A-7	0-5	90-100	85-100	70-100	60-95	60-85	30-55
	59-72	Clay, silty clay	CH, MH	A-7	0-5	90-100	85-100	75-100	65-95	60-85	25-55
57E*:											
Rock outcrop.											
Laidig----------	0-6	Very stony fine sandy loam.	GM-GC, CL-ML, SM-SC, SM	A-4	15-30	65-90	50-80	45-80	35-70	15-30	NP-10
	6-41	Channery loam, channery sandy clay loam, channery sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	5-20	70-95	55-90	40-80	20-70	15-40	2-18
	41-60	Channery sandy clay loam, channery loam, channery sandy loam.	GC, GM-GC, CL-ML, SC	A-2, A-4, A-6	5-20	50-90	40-85	30-80	15-70	15-35	2-16
58B2, 58C2-------	0-9	Silt loam--------	CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	80-95	23-35	5-15
Sequoia	9-36	Silty clay, clay, shaly silty clay.	CL, MH, CH	A-7	0	70-100	65-100	60-100	55-95	43-74	20-40
	36-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
59B2*, 59C2*, 59D2*:											
Sequoia--------	0-9	Silt loam--------	CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	80-95	23-35	5-15
	9-36	Silty clay, clay, shaly silty clay.	CL, MH, CH	A-7	0	70-100	65-100	60-100	55-95	43-74	20-40
	36-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Berks----------	0-6	Silt loam--------	CL, ML, CL-ML	A-4	0-10	80-100	75-100	65-85	50-75	25-36	5-10
	6-15	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
	15-31	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
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
60C*:											
Sequoia----------	0-9	Stony loam	GM, SM, CL	A-2, A-4	5-15	90-100	90-100	60-100	60-95	23-35	5-10
	9-36	Silty clay, clay	CL, MH, CH	A-7	0	70-100	65-100	60-100	55-95	45-75	20-40
	36-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
60C*:											
Berks	0-6	Stony loam	GM, SM, GC, SC	A-2, A-4	15-30	40-80	35-70	30-60	25-45	25-36	5-10
	6-15	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
	15-31	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
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
60D*:											
Sequoia	0-9	Stony loam	GM, SM, GC, SC	A-2, A-4	5-15	90-100	90-100	60-100	60-95	25-36	5-10
	9-36	Silty clay loam	CL, MH, CH	A-7	0	70-100	65-100	60-100	55-95	43-74	20-40
	36-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Berks	0-6	Stony loam	GM, SM, GC, SC	A-2, A-4	5-15	40-80	35-70	30-60	25-45	25-36	5-10
	6-15	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
	15-31	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
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
61B	0-7	Stony loam	ML, CL-ML, GM	A-4	5-30	60-75	50-75	45-60	35-55	<35	NP-10
Shelocta Variant	7-22	Silt loam, silty clay loam, clay loam.	GM, GM-GC, CL-ML	A-4, A-6	10-40	70-75	55-70	50-65	40-60	25-40	4-15
	22-54	Clay loam, clay	GC, CL, CH	A-7	10-40	70-75	55-70	50-70	45-65	40-60	20-35
	54-60	Cobbly clay loam, very cobbly clay loam.	GC, CL	A-6	40-80	60-75	55-80	50-75	40-70	25-40	10-20
62C	0-7	Very stony loam	GM	A-4	5-30	60-75	40-70	35-65	25-50	<35	NP-10
Shelocta Variant	7-22	Silt loam, silty clay loam, clay loam.	GM, GM-GC, CL-ML	A-4, A-6	10-40	70-75	55-70	50-65	40-60	25-40	4-15
	22-54	Clay loam, clay	GC, CL, CH	A-7	10-40	70-75	55-70	50-70	45-65	40-60	20-35
	54-60	Cobbly clay loam, very cobbly clay loam.	GC, CL	A-6	40-80	60-75	55-80	50-75	40-70	25-40	10-20
63B, 63C2, 63D2--	0-7	Loam	SM, ML, CL, SC	A-2, A-4, A-6	0-5	85-100	75-95	55-95	30-85	15-35	NP-15
Shenval	7-85	Clay loam, clay	MH, CH, ML, CL	A-7	0-10	75-100	75-100	70-100	55-100	45-85	20-46
64C, 64D	0-12	Cobbly sandy loam	SM, GM, GP-GM	A-2, A-4	25-50	80-95	75-90	45-70	20-45	<25	NP-5
Sherando	12-33	Very gravelly sandy loam, very cobbly sandy loam, gravelly sandy loam.	GM, SM, SP-SM, CP-GM	A-1	5-70	30-75	30-70	20-60	12-30	<25	NP-9
	33-60	Very gravelly loamy sand, very cobbly loamy sand.	GM, SM, SP-SM, GP	A-2, A-1	5-70	40-60	35-55	20-35	5-15	<21	NP

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
65B2, 65C2----- Swimley	0-7	Silty clay loam--	CL, CL-ML	A-4, A-6	0	85-100	85-100	75-100	60-95	24-38	5-16
	7-60	Clay----------	CH	A-7	0	85-100	85-100	80-100	75-95	50-70	30-45
66D, 66E----- Sylco	0-8	Flaggy silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-7	70-90	65-85	55-75	45-70	<26	NP-7
	8-23	Channery silt loam, flaggy silt loam, silt loam.	CL-ML, CL, GC, GM-GC	A-4	8-20	65-85	60-80	55-75	45-65	20-30	5-10
	23-34	Channery silt loam, flaggy silt loam.	GC, GM-GC, SC, SM-SC	A-2, A-4, A-1-b	20-45	35-70	30-65	25-55	20-45	20-30	5-10
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
67F----- Sylco	0-8	Very stony silt loam.	ML, CL-ML, GM, GM-GC	A-4	5-20	70-90	65-85	55-75	45-70	<26	NP-7
	8-23	Channery silt loam, flaggy silt loam, silt loam.	CL-ML, CL, GC, GM-GC	A-4	8-20	65-85	60-80	55-75	45-65	20-30	5-10
	23-34	Channery silt loam, flaggy silt loam.	GC, GM-GC, SC, SM-SC	A-2, A-4, A-1-b	20-45	35-70	30-65	25-55	20-45	20-30	5-10
	34	Unweathered	---	---	---	---	---	---	---	---	---
68B----- Timberville Variant	0-8	Silt loam--------	ML, CL-ML, SM-SC	A-4	0-3	75-100	75-100	55-95	35-85	<25	NP-7
	8-60	Silt loam, silty clay loam, cherty 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
	60-72	Clay, silty clay loam, cherty clay loam.	CL, CH	A-6, A-7	0-10	55-95	50-95	45-90	40-85	35-60	14-32
69A----- Tioga	0-12	Fine sandy loam	ML, SM	A-4	0	100	95-100	65-95	40-85	<15	NP-4
	12-30	Silt loam, loam, gravelly fine sandy loam.	SM, GM, ML	A-1, A-2, A-4	0	55-100	50-100	35-90	20-80	<15	NP-2
	30-72	Silt loam, loam, loamy sand.	SM, ML	A-1, A-2, A-4, A-3	0-10	95-100	85-100	75-90	75-85	<15	NP-10
70A*. Typic Udorthents											
71B2, 71C2----- Unison	0-8	Fine sandy loam	CL, ML, CL-ML, SM	A-4, A-6	0-25	75-100	75-100	60-95	50-90	20-38	2-15
	8-60	Clay loam, clay, gravelly silty clay.	CL, CH	A-6, A-7	0-25	75-100	65-100	60-100	55-95	35-65	15-35
72B2, 72C2, 72D2- Unison	0-8	Cobbly fine sandy loam.	ML, CL, CL-ML	A-4, A-6	25-45	80-90	75-90	60-85	55-80	20-35	2-15
	8-60	Clay, clay loam, gravelly silty clay.	CL, CH	A-6, A-7	0-25	75-100	65-100	60-100	55-95	35-65	15-35
73*. Urban land											
74E2*, 74F2*: Weikert----------	0-7	Shaly 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
	7-14	Weathered bedrock	GM, GP-GM	A-1, A-2	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
74E2*, 74F2*:											
Berks	0-6	Shaly silt loam	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	6-15	Shaly loam, very shaly loam, very 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
	15-31	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
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
75E2*, 75F2*:											
Weikert	0-7	Very stony silt loam.	GM, ML, SM	A-1, A-2, A-4	3-15	35-70	35-70	25-65	20-55	30-40	4-10
	7-14	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
	14	Weathered bedrock	---	---	---	---	---	---	---	---	---
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
	6-15	Shaly loam, very shaly loam, very 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
	15-31	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
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
76A Wheeling	0-9	Fine sandy loam	ML, CL, SM, SC	A-4	0	90-100	90-100	85-100	40-85	15-35	NP-10
	9-51	Silty clay loam, 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
	51-64	Stratified very fine sand to gravel.	GM, SM, GP, GW	A-1, A-2, A-3, A-4	10-20	65-90	50-75	45-70	4-45	<20	NP-10

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
1B----------	0-9	10-20	1.20-1.40	2.0-6.0	0.12-0.16	3.6-5.5	Low----------	0.28	4	<1
Allegheny	9-32	18-35	1.20-1.50	0.6-2.0	0.13-0.18	3.6-5.5	Low----------	0.28		
	32-54	10-35	1.20-1.40	0.6-2.0	0.08-0.17	3.6-5.5	Low----------	0.28		
	54-60	2-10	1.20-1.50	>6.0	0.02-0.08	3.6-5.5	Low----------	0.17		
2B----------	0-9	10-20	1.20-1.40	2.0-6.0	0.07-0.15	3.6-5.5	Low----------	0.20	3	<1
Allegheny	9-32	18-35	1.20-1.50	0.6-2.0	0.08-0.19	3.6-5.5	Low----------	0.28		
	32-54	10-35	1.20-1.40	0.6-2.0	0.08-0.19	3.6-5.5	Low----------	0.28		
	54-60	2-10	1.20-1.50	>6.0	0.02-0.08	3.6-5.5	Low----------	0.17		
3B*:										
Allegheny-------	0-9	10-20	1.20-1.40	2.0-6.0	0.12-0.16	3.6-5.5	Low----------	0.28	4	<1
	9-32	18-35	1.20-1.50	0.6-2.0	0.13-0.18	3.6-5.5	Low----------	0.28		
	32-54	10-35	1.20-1.40	0.6-2.0	0.08-0.17	3.6-5.5	Low----------	0.28		
	54-60	2-10	1.20-1.50	<6.0	0.02-0.08	3.6-5.5	Low----------	0.17		
Monongahela-----	0-10	10-27	1.20-1.40	0.6-2.0	0.18-0.24	4.5-5.5	Low----------	0.43	3	<1
	10-24	18-35	1.30-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.43		
	24-33	18-35	1.30-1.60	0.06-0.6	0.08-0.12	4.5-5.5	Low----------	0.43		
	33-60	20-55	1.35-1.55	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.37		
4A*.										
Aquic Udifluvents										
5C2*, 5D2*:										
Berks----------	0-6	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low----------	0.24	3	.5-1
	6-15	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	15-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	31	---	---	---	---	---	----------	----		
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
	7-14	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-6.0	Low----------	0.28		
	14	---	---	---	---	---	----------	----		
6C2*, 6D2*:										
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	.5-1
	6-15	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	15-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	31	---	---	---	---	---	----------	----		
Weikert---------	0-7	15-27	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.28	2	<1
	7-14	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.28		
	14	---	---	---	---	---	----------	----		
7A----------	0-7	10-27	1.20-1.40	0.6-2.0	0.14-0.20	3.6-5.5	Moderate-----	0.32	3-2	1-3
Buchanan	7-21	18-30	1.30-1.60	0.6-2.0	0.10-0.16	3.6-5.5	Moderate-----	0.24		
	21-60	18-35	1.40-1.70	0.06-0.2	0.06-0.10	3.6-5.5	Moderate-----	0.17		
8B, 8C----------	0-7	10-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Moderate-----	0.24	3-2	1-3
Buchanan	7-21	18-30	1.30-1.60	0.6-2.0	0.10-0.16	3.6-5.5	Moderate-----	0.24		
	21-60	18-35	1.40-1.70	0.06-0.2	0.06-0.10	3.6-5.5	Moderate-----	0.17		
9C----------	0-7	10-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Moderate-----	0.24	3-2	1-3
Buchanan	7-21	18-30	1.30-1.60	0.6-2.0	0.10-0.16	3.6-5.5	Moderate-----	0.24		
	21-60	18-35	1.40-1.70	0.06-0.2	0.06-0.10	3.6-5.5	Moderate-----	0.17		
10A----------	0-8	10-27	1.20-1.40	0.6-2.0	0.12-0.22	6.6-8.4	Low----------	0.37	3	2-4
Buckton	8-53	18-35	1.30-1.50	0.6-2.0	0.14-0.19	7.4-8.4	Low----------	0.28		
	53-80	5-15	1.30-1.50	0.6-6.0	0.06-0.14	7.4-8.4	Low----------	0.28		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
11B	0-11	5-15	1.25-1.55	2.0-6.0	0.08-0.15	4.5-6.5	Low	0.28	3	<1
Burketown	11-24	5-18	1.25-1.55	2.0-6.0	0.08-0.15	4.5-6.5	Low	0.28		
	24-44	5-15	1.70-1.90	0.06-0.2	0.08-0.12	4.5-6.5	Low	0.28		
	44-60	5-55	1.25-1.55	0.6-6.0	0.08-0.16	4.5-6.5	Low	0.28		
12B*, 12C*:										
Carbo	0-10	20-40	1.20-1.40	0.6-2.0	0.16-0.19	4.5-7.3	Moderate	0.37	2	.5-3
	10-32	60-80	1.30-1.50	0.06-0.2	0.10-0.14	5.6-7.8	High	0.24		
	32	---	---	---	---	---	---	---		
Endcav	0-7	10-25	1.20-1.40	0.6-2.0	0.17-0.22	5.1-7.3	Low	0.37	3	.5-2
	7-57	35-80	1.30-1.50	0.6-2.0	0.10-0.14	5.1-7.8	High	0.20		
	57	---	---	---	---	---	---	---		
Rock outcrop.										
13A	0-11	7-18	1.20-1.40	2.0-6.0	0.11-0.18	4.5-7.3	Low	0.24	4	.5-4
Chavies	11-42	7-18	1.20-1.40	2.0-6.0	0.11-0.20	4.5-7.3	Low	0.24		
	42-72	7-18	1.30-1.50	2.0-6.0	0.08-0.18	4.5-6.0	Low	0.24		
14B2, 14C2, 14D2, 15B2, 15C2, 15D2, 16E3	0-5	40-55	1.30-1.50	0.2-0.6	0.12-0.15	6.1-7.8	Moderate	0.28	2	.5-1
Chilhowie	5-13	60-80	1.30-1.50	0.06-0.2	0.10-0.15	6.1-7.8	High	0.24		
	13-25	55-80	1.20-1.50	0.06-0.2	0.02-0.05	6.6-8.4	High	0.24		
	25	---	---	---	---	---	---	---		
17B2*, 17C2*, 17D2*:										
Chilhowie	0-5	30-40	1.20-1.40	0.6-2.0	0.15-0.20	6.1-7.8	Moderate	0.37	2	.5-2
	5-13	60-80	1.30-1.50	0.06-0.2	0.10-0.15	6.1-7.8	High	0.24		
	13-25	55-80	1.20-1.50	0.06-0.2	0.02-0.05	6.6-8.4	High	0.24		
	25	---	---	---	---	---	---	---		
Edom	0-6	15-35	1.20-1.50	0.6-2.0	0.14-0.20	5.1-7.8	Low	0.28	3	.5-2
	6-34	35-60	1.30-1.60	0.2-2.0	0.10-0.14	5.1-7.8	Moderate	0.28		
	34-60	27-60	1.30-1.60	0.2-2.0	0.04-0.08	5.6-7.8	Moderate	0.17		
18B	0-15	7-27	1.20-1.40	0.6-6.0	0.12-0.20	3.6-5.5	Low	0.37	3	.5-2
Cotaco	15-60	18-35	1.20-1.50	0.6-2.0	0.07-0.15	3.6-5.5	Low	0.28		
19B	0-15	---	---	2.0-6.0	0.07-0.15	3.6-5.5	Low	0.24	3	.5-2
Cotaco	15-60	---	---	0.6-2.0	0.05-0.19	3.6-5.5	Low	0.28		
20B	0-5	12-27	1.30-1.50	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.24	3	0-2
Cotaco Variant	5-36	20-35	1.35-1.60	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.28		
	36-60	40-60	1.40-1.65	0.2-0.6	0.10-0.15	4.5-5.5	Moderate	0.28		
21B	0-8	5-15	1.20-1.50	2.0-20	0.07-0.15	4.5-5.5	Low	0.17	5	<1
Craigsville	8-22	5-15	1.30-1.60	2.0-20	0.06-0.15	4.5-5.5	Low	0.17		
	22-60	5-10	1.35-1.55	>6.0	0.04-0.09	4.5-5.5	Low	0.17		
22F	0-6	5-18	1.25-1.40	6.0-20.0	0.04-0.08	4.5-5.5	Low	0.17	3	.5-2
Drall	6-60	5-15	1.25-1.40	6.0-20.0	0.04-0.08	4.5-5.5	Low	0.17		
23B2, 23C2, 23D2-	0-6	15-35	1.20-1.50	0.6-2.0	0.14-0.20	5.1-7.8	Low	0.28	3	.5-4
Edom	6-34	35-60	1.30-1.60	0.2-2.0	0.10-0.14	5.1-7.8	Moderate	0.28		
	34-70	27-60	1.30-1.60	0.2-2.0	0.04-0.08	5.6-7.8	Moderate	0.17		
24B2, 24C2, 25B2, 25C2	0-7	10-25	1.20-1.40	0.6-2.0	0.17-0.22	5.1-7.3	Low	0.37	3	.5-2
Endcav	7-57	35-80	1.30-1.50	0.06-0.2	0.10-0.14	5.1-7.8	High	0.20		
	57	---	---	---	---	---	---	---		
26C2, 26D2	0-7	10-25	1.25-1.55	0.6-6.0	0.15-0.21	5.1-6.0	Low	0.32	3	1-3
Fauquier	7-45	35-60	1.35-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate	0.28		
	45	---	---	---	---	---	---	---		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
27E----------	0-7	10-25	1.25-1.55	0.6-6.0	0.15-0.21	5.1-6.0	Low----------	0.28	4	1-3
Fauquier	7-45	35-60	1.35-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.28		
	45	---	---	---	---	---	----------	----		
28A*.										
Fluvaquents										
29B2*, 29C2*, 29D2*, 29E2*:										
Frederick------	0-9	13-23	1.25-1.50	2.0-6.0	0.15-0.24	4.5-6.0	Low----------	0.32	4	1-3
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	Moderate-----	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	High---------	0.24		
	59-72	45-80	1.40-1.65	0.6-2.0	0.09-0.20	4.5-5.5	Moderate-----	0.24		
Lodi----------	0-7	12-25	1.20-1.50	0.6-6.0	0.14-0.18	4.5-5.5	Low----------	0.37	4	.5-2
	7-11	35-60	1.30-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Moderate-----	0.28		
	11-72	10-50	1.35-1.65	0.6-2.0	0.08-0.18	4.5-5.5	Moderate-----	0.28		
30C3*, 30D3*:										
Frederick-------	0-9	27-35	1.30-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.32	4	.5-2
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	Moderate-----	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	High---------	0.24		
	59-72	45-80	1.40-1.65	0.6-2.0	0.09-0.20	4.5-5.5	Moderate-----	0.24		
Lodi----------	0-7	20-40	1.30-1.60	0.6-2.0	0.12-0.18	4.5-5.5	Moderate-----	0.28	3	.5-2
	7-11	35-60	1.30-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Moderate-----	0.28		
	11-72	10-50	1.35-1.65	0.6-2.0	0.08-0.18	4.5-5.5	Moderate-----	0.28		
31B2*, 31C2*, 31D2*, 31E2*:										
Frederick------	0-9	13-35	1.25-1.55	2.0-6.0	0.12-0.20	4.5-6.0	Low----------	0.28	4	1-3
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.10-0.18	4.5-5.5	Moderate-----	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.10-0.18	4.5-5.5	High---------	0.24		
Lodi----------	0-7	12-25	1.25-1.55	0.6-6.0	0.07-0.14	4.5-5.5	Low----------	0.28	4	.5-2
	7-11	35-60	1.30-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Moderate-----	0.28		
	11-72	10-50	1.35-1.65	0.6-2.0	0.08-0.18	4.5-5.5	Moderate-----	0.28		
32C*, 32D*, 32E*:										
Frederick-------	0-9	13-35	1.30-1.65	2.0-6.0	0.10-0.16	4.5-6.0	Low----------	0.28	4	1-3
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.10-0.18	4.5-5.5	Moderate-----	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.10-0.18	4.5-5.5	High---------	0.24		
Lodi----------	0-7	12-25	1.25-1.55	0.6-6.0	0.07-0.14	4.5-5.5	Low----------	0.28	4	.5-2
	7-11	35-60	1.30-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Moderate-----	0.28		
	11-72	10-50	1.35-1.65	0.6-2.0	0.08-0.18	4.5-5.5	Moderate-----	0.28		
33B2*, 33C2*, 33D2*, 33E2*:										
Frederick------	0-9	13-23	1.25-1.50	2.0-6.0	0.15-0.24	4.5-6.0	Low----------	0.32	4	1-3
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	Moderate-----	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	High---------	0.24		
	59-72	45-80	1.40-1.65	0.6-2.0	0.09-0.20	4.5-5.5	Moderate-----	0.24		
Lodi----------	0-7	12-25	1.20-1.50	0.6-6.0	0.14-0.18	4.5-5.5	Low----------	0.37	4	.5-2
	7-11	35-60	1.30-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Moderate-----	0.28		
	11-72	10-50	1.35-1.65	0.6-2.0	0.08-0.18	4.5-5.5	Moderate-----	0.28		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
34C*, 34E*:										
Frederick	0-9	13-23	1.25-1.50	2.0-6.0	0.15-0.24	4.5-6.0	Low	0.32	4	1-3
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	Moderate	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	High	0.24		
	59-72	45-80	1.40-1.65	0.6-2.0	0.09-0.20	4.5-5.5	Moderate	0.24		
Rock outcrop.										
35B	0-10	13-27	1.30-1.50	0.6-2.0	0.19-0.24	4.5-6.0	Low	0.43	3	1-3
Guernsey	10-19	22-38	1.35-1.55	0.2-2.0	0.15-0.21	4.5-6.0	Moderate	0.43		
	19-60	35-60	1.45-1.70	0.06-0.6	0.10-0.15	5.1-7.8	Moderate	0.32		
36B, 37B	0-9	12-27	1.00-1.20	0.6-6.0	0.08-0.14	5.6-6.5	Low	0.17	4	.1-2
Hawksbill	9-26	18-35	1.20-1.50	0.6-2.0	0.08-0.14	5.6-7.3	Low	0.17		
	26-36	15-35	1.20-1.50	0.6-2.0	0.04-0.10	5.6-7.3	Low	0.17		
	36-60	10-35	1.20-1.60	0.6-6.0	0.04-0.10	5.6-7.3	Low	0.17		
38C	0-9	12-27	1.00-1.20	0.6-6.0	0.08-0.14	5.6-6.5	Low	0.17	3	.1-2
Hawksbill	9-26	18-35	1.20-1.50	0.6-2.0	0.08-0.14	5.6-7.3	Low	0.17		
	26-36	15-35	1.20-1.50	0.6-2.0	0.04-0.10	5.6-7.3	Low	0.17		
	36-60	10-35	1.20-1.60	0.6-6.0	0.04-0.10	5.6-7.3	Low	0.17		
39B, 39C	0-6	7-20	1.20-1.40	0.6-6.0	0.09-0.12	3.6-5.5	Low	0.28	4	1-3
Laidig	6-41	18-35	1.30-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.28		
	41-60	18-35	1.30-1.60	0.2-0.6	0.06-0.10	3.6-5.5	Low	0.17		
40B, 40C, 40D, 40E	0-6	7-27	1.20-1.40	0.6-6.0	0.09-0.14	3.6-5.5	Low	0.28	4	1-3
Laidig	6-41	18-35	1.30-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.28		
	41-60	18-35	1.30-1.60	0.2-0.6	0.06-0.10	3.6-5.5	Low	0.17		
41C, 41D, 41E	0-6	7-27	1.20-1.40	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.28	4	1-3
Laidig	6-41	18-35	1.30-1.50	0.6-6.0	0.08-0.10	3.6-5.5	Low	0.28		
	41-60	18-35	1.30-1.60	0.2-0.6	0.06-0.10	3.6-5.5	Low	0.17		
42C*:										
Laidig	0-6	7-27	1.20-1.40	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.28	4	1-3
	6-41	18-35	1.30-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.28		
	41-60	18-35	1.30-1.60	0.2-0.6	0.06-0.10	3.6-5.5	Low	0.17		
Buchanan	0-7	10-27	1.20-1.40	0.6-2.0	0.11-0.16	3.6-5.5	Moderate	0.24	3-2	1-3
	7-21	18-30	1.30-1.60	0.6-2.0	0.10-0.16	3.6-5.5	Moderate	0.24		
	21-60	18-35	1.40-1.70	0.06-0.2	0.06-0.10	3.6-5.5	Moderate	0.17		
43C*, 43D*:										
Lehew	0-15	4-16	1.20-1.40	2.0-20	0.08-0.12	4.5-5.5	Low	0.17	3	1-2
	15-29	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low	0.17		
	29	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low	0.17		
	32	---	---	---	---	---	---	---		
Dekalb	0-6	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-6.5	Low	0.17	3	<2
	6-34	5-15	1.20-1.50	>6.0	0.05-0.10	3.6-5.5	Low	0.17		
	34	---	---	---	---	---	---	---		
Calvin	0-7	10-25	1.20-1.40	2.0-6.0	0.10-0.16	4.5-6.0	Low	0.20	3-2	.5-2
	7-21	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-6.0	Low	0.20		
	21-26	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-6.0	Low	0.20		
	26	---	---	---	---	---	---	---		
44E*:										
Lehew	0-15	4-16	1.20-1.40	2.0-20	0.08-0.12	4.5-5.5	Low	0.17	3	1-2
	15-29	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low	0.17		
	29	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low	0.17		
	32	---	---	---	---	---	---	---		
Dekalb	0-6	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-6.5	Low	0.17	3	<2
	6-34	5-15	1.20-1.50	>6.0	0.05-0.10	3.6-5.5	Low	0.17		
	34	---	---	---	---	---	---	---		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
44E*:										
Calvin	0-7	10-25	1.20-1.40	2.0-6.0	0.10-0.18	4.5-6.0	Low	0.15	3-2	1-2
	7-21	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-6.0	Low	0.20		
	21-26	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-6.0	Low	0.20		
	26	---	---	---	---	---	---	---		
44F*:										
Lehew	0-15	4-16	1.20-1.40	2.0-20	0.08-0.12	4.5-5.5	Low	0.17	3	1-2
	15-29	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low	0.17		
	29	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low	0.17		
	32	---	---	---	---	---	---	---		
Dekalb	0-6	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-6.5	Low	0.17	3	<2
	6-34	5-15	1.20-1.50	>6.0	0.05-0.10	3.6-5.5	Low	0.17		
	34	---	---	---	---	---	---	---		
Calvin	0-7	10-25	1.20-1.40	2.0-6.0	0.10-0.18	4.5-6.0	Low	0.15	3-2	1-2
	7-21	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-6.0	Low	0.20		
	21-26	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-6.0	Low	0.20		
	26	---	---	---	---	---	---	---		
45A	0-11	20-26	1.20-1.55	0.6-2.0	0.14-0.20	7.4-8.4	Low	0.37	5	4-6
Massanetta	11-25	20-32	1.35-1.65	0.6-2.0	0.14-0.20	7.4-8.4	Low	0.37		
	25-64	22-32	1.30-1.60	0.6-2.0	0.12-0.20	7.4-8.4	Low	0.28		
	64-80	---	---	---	---	---	---	---		
46A	0-6	0-15	1.20-1.40	6.0-20	0.04-0.08	6.1-7.3	Low	0.17	2	<1
Millrock	6-40	0-15	1.20-1.40	6.0-20	0.04-0.08	6.1-7.3	Low	0.17		
	40-60	0-15	1.20-1.40	6.0-20	0.04-0.08	6.1-7.3	Low	0.17		
47B, 47C2	0-10	10-27	1.20-1.40	0.6-2.0	0.18-0.24	4.5-5.5	Low	0.43	3	<2
Monongahela	10-24	18-35	1.30-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Low	0.43		
	24-33	18-35	1.30-1.60	0.06-0.6	0.08-0.12	4.5-5.5	Low	0.43		
	33-60	20-55	1.35-1.55	0.2-0.6	0.08-0.12	4.5-5.5	Low	0.37		
48B, 48C	0-18	10-27	1.20-1.40	0.6-2.0	0.16-0.22	4.5-5.5	Low	0.37	3	<2
Monongahela	18-24	18-35	1.30-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Low	0.43		
	24-33	18-35	1.30-1.60	0.06-0.6	0.08-0.12	4.5-5.5	Low	0.43		
	33-60	20-55	1.35-1.55	0.2-0.6	0.08-0.12	4.5-5.5	Low	0.37		
49C	0-5	5-20	1.20-1.50	2.0-6.0	0.14-0.20	4.5-6.0	Low	0.32	4	1-3
Myersville	5-30	18-35	1.20-1.50	0.6-2.0	0.14-0.18	4.5-6.0	Low	0.32		
	30-44	10-32	1.20-1.50	0.6-2.0	0.08-0.16	4.5-6.0	Low	0.32		
	44	---	---	---	---	---	---	---		
49D, 49F	0-5	5-20	1.20-1.50	2.0-6.0	0.14-0.20	4.5-6.0	Low	0.32	4	1-3
Myersville	5-30	18-35	1.20-1.50	0.6-2.0	0.14-0.18	4.5-6.0	Low	0.32		
	30-44	10-32	1.20-1.50	0.6-2.0	0.08-0.16	4.5-6.0	Low	0.32		
	44	---	---	---	---	---	---	---		
50B*, 50C*:										
Nixa	0-16	5-25	1.30-1.60	0.6-2.0	0.08-0.10	4.5-5.5	Low	0.43	2	1-2
	16-39	20-35	1.40-1.80	<0.06	0.05-0.08	4.5-5.5	Low	0.43		
	39-60	30-50	1.30-1.45	<0.06	0.03-0.06	4.5-5.5	Low	0.37		
Frederick	0-9	13-35	1.25-1.55	2.0-6.0	0.12-0.20	4.5-6.0	Low	0.28	4	1-3
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.10-0.18	4.5-5.5	Moderate	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.10-0.18	4.5-5.5	High	0.24		
Lodi	0-7	12-25	1.25-1.55	0.6-6.0	0.07-0.14	4.5-5.5	Low	0.28	4	.5-2
	7-11	35-60	1.30-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Moderate	0.28		
	11-72	10-50	1.35-1.65	0.6-2.0	0.08-0.18	4.5-5.5	Moderate	0.28		
51*, 52*. Pits										
53*. Pits and dumps										

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
54A----------	0-7	18-35	1.30-1.50	0.2-0.6	0.18-0.24	3.6-5.5	Moderate-----	0.43	3	<2
Purdy	7-36	35-50	1.30-1.60	<0.2	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	36-60	35-50	1.30-1.60	<0.2	0.10-0.16	3.6-5.5	Moderate-----	0.28		
55C*:										
Rock outcrop.										
Carbo----------	0-10	20-40	1.20-1.40	0.6-2.0	0.16-0.19	4.5-7.3	Moderate-----	0.37	2	.5-3
	10-32	60-80	1.30-1.50	0.06-0.2	0.10-0.14	5.6-7.8	High----------	0.24		
	32	---	---	---	---	---	----------	----		
56C*, 56D*:										
Rock outcrop.										
Frederick-------	0-9	13-23	1.25-1.50	2.0-6.0	0.15-0.24	4.5-6.0	Low----------	0.32	4	1-3
	9-13	20-40	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
	13-39	40-75	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	Moderate-----	0.24		
	39-59	50-85	1.40-1.65	0.6-2.0	0.09-0.18	4.5-5.5	High----------	0.24		
	59-72	45-80	1.40-1.65	0.6-2.0	0.09-0.20	4.5-5.5	Moderate-----	0.24		
57E*:										
Rock outcrop.										
Laidig----------	0-5	7-27	1.20-1.40	0.6-6.0	0.08-0.12	3.6-5.5	Low----------	0.28	4	1-3
	5-36	18-35	1.30-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low----------	0.28		
	36-72	18-35	1.30-1.60	0.2-0.6	0.06-0.10	3.6-5.5	Low----------	0.17		
58B2, 58C2-------	0-9	15-27	1.30-1.50	0.6-2.0	0.17-0.20	4.5-5.5	Low----------	0.37	3	.5-2
Sequoia	9-36	35-60	1.35-1.55	0.2-0.6	0.08-0.16	4.5-5.5	Moderate-----	0.24		
	36-60	---	---	---	---	---	----------	----		
59B2*, 59C2*, 59D2*:										
Sequoia---------	0-9	15-27	1.30-1.50	0.6-2.0	0.17-0.20	4.5-5.5	Low----------	0.37	3	.5-2
	9-36	35-60	1.35-1.55	0.2-0.6	0.08-0.16	4.5-5.5	Moderate-----	0.24		
	36-60	---	---	---	---	---	----------	----		
Berks----------	0-6	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low----------	0.24	3	.5-3
	6-15	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	15-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	31	---	---	---	---	---	----------	----		
60C*:										
Sequoia---------	0-9	15-27	1.30-1.50	0.6-2.0	0.17-0.20	4.5-5.5	Low----------	0.37	3	.5-2
	9-36	35-60	1.35-1.55	0.02-0.06	0.08-0.16	3.6-6.5	Moderate-----	0.27		
	36-60	---	---	---	---	---	----------	----		
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	.5-2
	6-15	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	15-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	31	---	---	---	---	---	----------	----		
60D*:										
Sequoia---------	0-9	15-27	1.20-1.50	0.6-2.0	0.17-0.20	4.5-5.5	Low----------	0.37	3	.5-2
	9-36	35-60	1.20-1.60	0.2-0.6	0.08-0.16	3.6-6.5	Moderate-----	0.27		
	36-60	---	---	---	---	---	----------	----		
Berks----------	0-10	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low----------	0.17	3	.5-2
	10-26	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	26-33	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	33	---	---	---	---	---	----------	----		
61B----------	0-7	12-27	1.35-1.50	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.32	3	0-2
Shelocta Variant	7-45	20-35	1.40-1.55	0.6-2.0	0.10-0.16	4.5-6.0	Moderate-----	0.32		
	45-54	35-60	1.55-1.65	0.6-2.0	0.10-0.15	4.5-6.0	Moderate-----	----		
	54-60	27-40	1.45-1.55	0.6-2.0	0.14-0.18	4.5-6.0	Moderate-----	----		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
62C----------	0-7	12-27	1.35-1.50	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.32	3	0-2
Shelocta Variant	7-22	20-35	1.40-1.55	0.6-2.0	0.10-0.16	4.5-6.0	Moderate-----	0.32		
	22-54	35-60	1.55-1.65	0.6-2.0	0.10-0.15	4.5-6.0	Moderate-----	----		
	54-60	27-40	1.45-1.55	0.2-0.6	0.14-0.18	4.5-6.0	Moderate-----	----		
63B, 63C2, 63D2--	0-7	10-18	1.25-1.55	0.6-6.0	0.10-0.19	5.1-6.0	Low----------	0.32	4	1-2
Shenval	7-85	35-80	1.35-1.65	0.6-2.0	0.12-0.17	4.5-6.0	Moderate-----	0.24		
64C, 64D----------	0-12	5-15	1.35-1.65	2.0-6.0	0.08-0.12	3.6-6.0	Low----------	0.17	4	.5-2
Sherando	12-33	5-10	1.40-1.70	>6.0	0.04-0.06	4.5-5.5	Low----------	0.17		
	33-60	---	---	>6.0	0.04-0.06	4.5-5.5	Low----------	0.17		
65B2, 65C2-------	0-7	25-40	1.20-1.40	0.6-2.0	0.10-0.19	4.5-7.3	Low----------	0.37	4	.5-1
Swimley	7-60	60-80	1.30-1.60	0.6-2.0	0.07-0.14	4.5-7.3	Moderate-----	0.28		
66D, 66E----------	0-8	15-25	1.00-1.20	0.6-2.0	0.11-0.16	4.5-5.5	Low----------	0.20	3	<2
Sylco	8-23	15-25	1.20-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
	23-34	15-25	1.20-1.50	0.6-2.0	0.05-0.10	4.5-5.5	Low----------	0.15		
	34	---	---	---	---	---	----------	----		
67F----------	0-8	15-25	1.00-1.20	0.6-2.0	0.11-0.16	4.5-5.5	Low----------	0.20	3	<2
Sylco	8-23	15-25	1.20-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
	23-34	15-25	1.20-1.50	0.6-2.0	0.05-0.10	4.5-5.5	Low----------	0.15		
	34	---	---	---	---	---	----------	----		
68B----------	0-8	6-25	1.30-1.50	2.0-6.0	0.11-0.18	3.6-6.0	Low----------	0.32	4	1-3
Timberville	8-60	13-25	1.30-1.50	0.6-2.0	0.11-0.19	3.6-6.0	Low----------	0.24		
Variant	60-72	35-60	1.40-1.60	0.6-2.0	0.14-0.18	3.6-6.0	Moderate-----	0.24		
69A----------	0-12	5-18	1.15-1.40	0.6-6.0	0.15-0.21	5.1-7.3	Low----------	0.37	5	<2
Tioga	12-30	5-18	1.15-1.45	0.6-6.0	0.07-0.20	5.1-7.3	Low----------	0.28		
	30-72	3-15	1.25-1.55	0.6-20	0.02-0.20	5.6-7.8	Low----------	0.28		
70A*.										
Typic Udorthents										
71B2, 71C2-------	0-8	10-25	1.35-1.65	0.6-6.0	0.14-0.20	4.5-6.0	Low----------	0.32	4	1-3
Unison	8-60	30-70	1.30-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
72B2, 72C2, 72D2-	0-8	10-25	1.35-1.65	0.6-6.0	0.11-0.17	4.5-6.0	Low----------	0.24	4	1-3
Unison	8-60	30-70	1.30-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Moderate-----	0.24		
73*.										
Urban land										
74E2*, 74F2*:										
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	1-3
	7-14	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-6.0	Low----------	0.28		
	14	---	---	---	---	---	----------	----		
Berks----------	0-6	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-6.5	Low----------	0.24	3	.5-3
	6-15	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	15-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	31	---	---	---	---	---	----------	----		
75E2*, 75F2*:										
Weikert----------	0-7	15-27	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.28	2	1-3
	7-14	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.28		
	14	---	---	---	---	---	----------	----		
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	.5-2
	6-15	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	15-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-6.5	Low----------	0.17		
	31	---	---	---	---	---	----------	----		
76A----------	0-9	12-20	1.20-1.40	0.6-6.0	0.12-0.18	5.1-6.0	Low----------	0.32	4	1-2
Wheeling	9-51	18-30	1.30-1.50	0.6-2.0	0.08-0.16	5.1-6.0	Low----------	0.28		
	51-64	18-15	1.30-1.50	6.0-20.	0.04-0.08	5.1-6.0	Low----------	0.24		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
1B, 2B---------- Allegheny	B	None---------	---	---	>6.0	---	Low----	>60	---	Low-------	Low-------	High.
3B*: Allegheny---------	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Low-------	High.
Monongahela------	C	None---------	---	---	1.5-3.0	Perched	Dec-Apr	>60	---	Moderate	High------	High.
4A*. Aquic Udifluvents												
5C2*, 5D2*, 6C2*, 6D2*: Berks----------	C	None---------	---	---	>6.0	---	---	20-40	Soft	Low-------	Low-------	High.
Weikert---------	C/D	None---------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
7A, 8B, 8C, 9C---- Buchanan	C	None---------	---	---	0.5-3.0	Perched	Nov-Mar	>60	---	Moderate	High------	High.
10A--------------- Buckton	B	Occasional	Very brief	Dec-Jun	>6.0	---	---	>60	---	Moderate	Low-------	Low.
11B--------------- Burketown	C	None---------	---	---	2.0-3.5	Perched	Nov-Apr	>60	---	Moderate	Moderate	Moderate.
12B*, 12C*: Carbo----------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Moderate	High------	Low.
Endcav----------	C	None---------	---	---	>6.0	---	---	>40	Hard	Moderate	High------	Low.
Rock outcrop.												
13A--------------- Chavies	B	Rare---------	---	---	>6.0	---	---	>60	---	Low-------	Low-------	Moderate.
14B2, 14C2, 14D2, 15B2, 15C2, 15D2, 16E3---------- Chilhowie	C	None---------	---	---	>6.0	---	---	20-40	Hard	Moderate	High------	Low.
17B2*, 17C2*, 17D2*: Chilhowie-------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Moderate	High------	Low.
Edom----------	C	None---------	---	---	>6.0	---	---	40-60	Soft	Moderate	High------	Low.
18B, 19B---------- Cotaco	C	None---------	---	---	1.5-2.5	Apparent	Nov-May	>60	---	High------	Moderate	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
20B---------- Cotaco Variant	C	None--------	---	---	2.0-3.0	Perched	Dec-Apr	>60	---	High-----	High-----	High.
21B---------- Craigsville	B	Frequent----	Very brief	Nov-May	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
22F---------- Drall	B	None--------	---	---	>6.0	---	---	40-60	Hard	Low------	Low------	High.
23B2, 23C2, 23D2-- Edom	C	None--------	---	---	>6.0	---	---	40-60	Soft	Moderate	High-----	Low.
24B2, 24C2, 25B2, 25C2---------- Endcav	C	None--------	---	---	>6.0	---	---	>40	Hard	Moderate	High-----	Low.
26C2, 26D2, 27E--- Fauquier	C	None--------	---	---	>6.0	---	---	>40	Soft	Moderate	High-----	High.
28A*. Fluvaquents												
29B2*, 29C2*, 29D2*, 29E2*, 30C3*, 30D3*, 31B2*, 31C2*, 31D2*, 31E2*, 32C*, 32D*, 32E*, 33B2*, 33C2*, 33D2*, 33E2*:												
Frederick-------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
Lodi----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
34C*, 34E*: Frederick--------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
Rock outcrop.												
35B---------- Guernsey	C	None--------	---	---	2.0-3.5	Perched	Jan-Apr	>60	---	Moderate	High-----	Moderate.
36B, 37B, 38C----- Hawksbill	B	Common------	Very brief	Apr-Oct	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
39B, 39C, 40B, 40C, 40D, 40E, 41C, 41D, 41E---- Laidig	C	None--------	---	---	2.5-4.0	Perched	Jan-Mar	>60	---	Moderate	Moderate	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
42C*:												
Laidig	C	None	---	---	2.5-4.0	Perched	Jan-Mar	>60	---	Moderate	Moderate	High.
Buchanan	C	None	---	---	0.5-3.0	Perched	Nov-Mar	>60	---	Moderate	High	High.
43C*, 43D*:												
Lehew	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Low	High.
Dekalb	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Low	High.
Calvin	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Low	Moderate.
44E*, 44F*:												
Lehew	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Low	High.
Dekalb	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Low	High.
Calvin	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Low	Moderate.
45A Massanetta	B	Occasional	Very brief	May-Sep	2.0-3.5	Apparent	Jan-Apr	>60	---	Moderate	Low	Low.
46A Millrock	A	Frequent	Very brief	Dec-Sep	>6.0	---	---	>60	---	Low	Low	Moderate.
47B, 47C2, 48B, 48C Monongahela	C	None	---	---	1.5-3.0	Perched	Dec-Apr	>60	---	Moderate	High	High.
49C, 49D, 49F Myersville	B	None	---	---	>6.0	---	---	>40	Hard	Moderate	Moderate	Moderate.
50B*, 50C*:												
Nixa	C	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Frederick	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
Lodi	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
51*, 52*. Pits												
53*. Pits and dumps												
54A Purdy	D	None	---	---	+1-1.0	Apparent	Nov-Jun	>60	---	High	High	High.
55C*:												
Rock outcrop.												
Carbo	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
56C*, 56D*: Rock outcrop.												
Frederick	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
57E*: Rock outcrop.												
Laidig	C	None	---	---	2.5-4.0	Perched	Jan-Mar	>60	---	Moderate	Moderate	High.
58B2, 58C2 Sequoia	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Moderate.
59B2*, 59C2*, 59D2*: Sequoia	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Moderate.
Berks	C	None	---	---	>6.0	---	---	20-40	Soft	Low	Low	High.
60C*, 60D*: Sequoia	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Moderate.
Berks	C	None	---	---	>6.0	---	---	20-40	Soft	Low	Low	High.
61B, 62C Shelocta Variant	C	None	---	---	>5.0	---	---	>60	---	Moderate	Moderate	High.
63B, 63C2, 63D2 Shenval	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.
64C, 64D Sherando	B	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
65B2, 65C2 Swimley	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
66D, 66E, 67F Sylco	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Low	Moderate.
68B Timberville Variant	B	Frequent	Very brief	Apr-Oct	>6.0	---	---	>60	---	Moderate	Low	High.
69A Tioga	B	Rare	---	---	3.0-6.0	Apparent	Feb-Apr	>60	---	Moderate	Low	Moderate.
70A*. Typic Udorthents												
71B2, 71C2, 72B2, 72C2, 72D2 Unison	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
73* Urban land												

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
74E2*, 74F2*, 75E2*, 75F2*:												
Weikert	C/D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
Berks	C	None	---	---	>6.0	---	---	20-40	Soft	Low	Low	High.
76A Wheeling	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--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
*Berks	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Buchanan	Fine-loamy, mixed, mesic Aquic Fragiudults
Buckton	Fine-loamy, mixed (calcareous), mesic Typic Udifluvents
Burketown	Coarse-loamy, siliceous, mesic Typic Fragiudults
Calvin	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Carbo	Very-fine, mixed, mesic Typic Hapludalfs
*Chavies	Coarse-loamy, mixed, mesic Ultic Hapludalfs
Chilhowie	Very-fine, mixed, mesic Typic Hapludalfs
Cotaco	Fine-loamy, mixed, mesic Aquic Hapludults
Cotaco Variant	Fine loamy mixed mesic Aquic Hapludults
Craigsville	Loamy-skeletal, mixed, mesic Fluventic Dystrochrepts
Dekalb	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Drall	Sandy-skeletal, siliceous, mesic Typic Udorthents
Edom	Fine, illitic, mesic Typic Hapludalfs
Endcav	Very-fine, mixed, mesic Typic Hapludalfs
Fauquier	Fine, mixed, mesic Ultic Hapludalfs
Frederick	Clayey, mixed, mesic Typic Paleudults
*Guernsey	Fine, mixed, mesic Aquic Hapludalfs
Hawksbill	Loamy-skeletal, mixed, mesic Typic Hapludalfs
Laidig	Fine-loamy, mixed, mesic Typic Fragiudults
Lehew	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Lodi	Clayey, mixed, mesic Typic Hapludults
Massanetta	Fine-loamy, carbonatic, mesic Fluvaquentic Hapludolls
Millrock	Mixed, mesic Alfic Udipsamments
Monongahela	Fine-loamy, mixed, mesic Typic Fragiudults
*Myersville	Fine-loamy, mixed, mesic Ultic Hapludalfs
*Nixa	Loamy-skeletal, siliceous, mesic Glossic Fragiudults
Purdy	Clayey, mixed, mesic Typic Ochraquults
*Sequoia	Clayey, mixed, mesic Typic Hapludults
Shelocta Variant	Clayey, mixed, mesic Typic Hapludults
Shenval	Fine, mixed, mesic Typic Paleudalfs
Sherando	Loamy-skeletal, siliceous, mesic Typic Dystrochrepts
*Swimley	Very-fine, mixed, mesic Typic Paleudalfs
*Sylco	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Timberville Variant	Fine-loamy, mixed, mesic Typic Hapludults
Tioga	Coarse-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Unison	Clayey, mixed, mesic Typic Hapludults
Weikert	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
*Wheeling	Fine-loamy, mixed, mesic Ultic Hapludalfs

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